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Lake Superior Iron Ore Annual

For 1912
and Preceding Years

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The 1913
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Official Figures on
Shipments by Mines, Ranges and Ports together
with Complete Statistics Bearing on the Lake
Superior Ore Movement since 1844.
Ore Prices, Receipts at Lower Lake Docks

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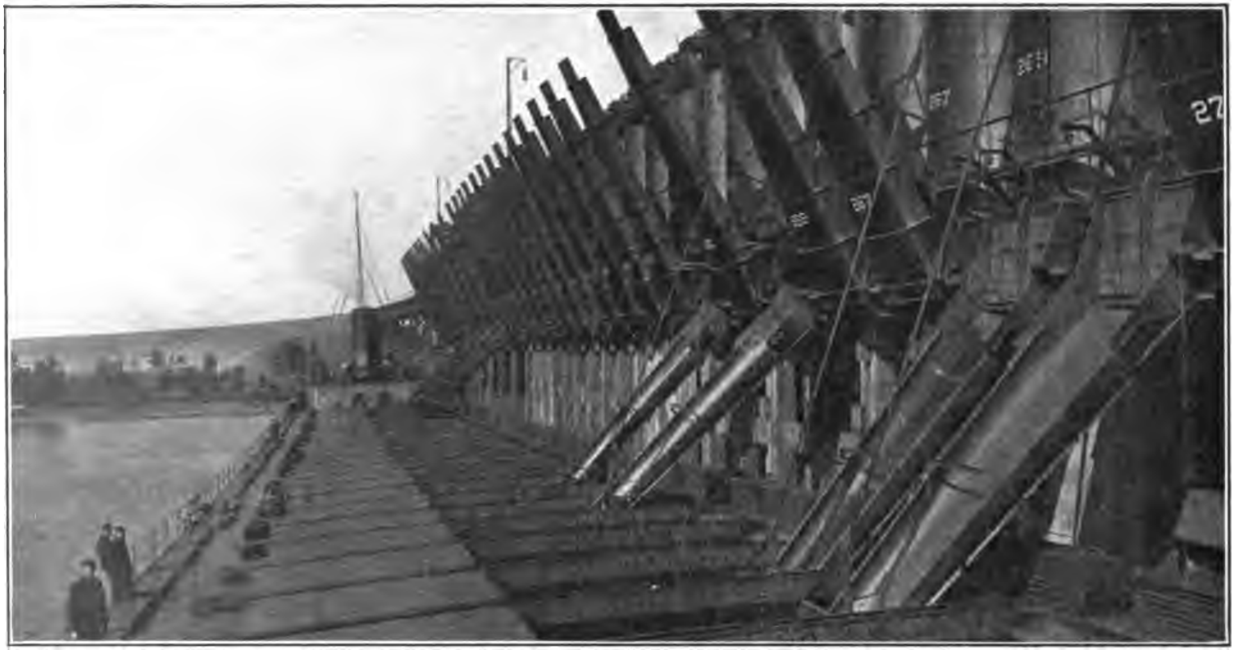

New Concrete and Steel Ore Dock at Presque Isle

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Ore Mining Costs in Lake District

BY EDWIN C. ECKEL.*

When J. R. Finlay, in 1909, prepared his valuable monograph on "The Cost of Mining", he noted that he could find no general data on the cost of mining iron ores in the Lake Superior district. Data concerning the costs at individual mines were available, it is true, but they did not cover sufficient tonnage and sufficient variety in operating conditions to make them serviceable as bases for drawing conclusions regarding the average cost of the entire Lake Superior output, or of any considerable proportion of it.

In this respect, conditions have changed radically since 1909, owing to the extensive and unsolicited publicity which different branches of the iron business have received from various departments of both the federal and state governments. To one who has not kept close account of this line of activity, it is difficult to realize how far it has extended. The matter may fairly be summarized by saying that during the past three years, investigations of more or less moment to the iron industry have been carried on by the House of Representatives, the Department of Justice, the Bureau of Corporations, the United States Geological Survey, and the Michigan and Minnesota Tax Commissions. Many of the results of these investigations have been placed before the public for its instruction or amusement. An estimate, which I made recently, places the total amount of reports and other publications issued by the above agencies, since 1909, dealing with the iron business, as being in excess of 20,000 printed pages. For convenience, we may say that over 10,000,000 words of printed information, advice or warning have been showered on this industry during the past three years.

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Of course, the bulk of this enormous tonnage is of no interest to the engineer, or indeed to anyone else dealing with the realities of life. But, on the other hand, it is difficult for any set of men, the *Congressional Record* to the contrary notwithstanding, to utter 10,000,000 words without including any facts whatsoever. And so, on carefully examining this large mass of available published material, we come at intervals on something which really seems to be worthy of being sorted out and put in shape for use. The status of ownership in the Lake Superior district has been the principal bone of contention, and accordingly much of the really serviceable data relates to that region. Among these are several sets of costs of iron ore mining and shipping, which it is interesting to place in such form that they can be readily compared with each other.

Table I—Average Cost Per Ton, 1902-1906

	Marquette.	Menominee.	Gogebic.	Vermillion.	Mesabi.	Total.
Labor costs	$0.79	$0.78	$0.78	$0.50	$0.26	$0.45
Other mining costs	0.57	0.58	0.53	0.44	0.26	0.37
Royalties	0.10	0.24	0.39	0.33	0.26	0.25
Total costs at mine	$1.46	$1.60	$1.70	$1.27	$0.78	$1.07
Rail freight	0.30	0.40	0.40	0.99	0.80	0.67
Water freight	0.68	0.59	0.77	0.77	0.77	0.74
Total cost at lower lake ports	$2.44	$2.59	$2.87	$3.03	$2.35	$2.48
General charges	0.18	0.34	0.22	0.17	0.10	0.16
Total book costs	$2.62	$2.93	$3.09	$3.20	$2.45	$2.64

Tons covered by data:—Marquette, 12,616,253; Menominee, 11,358,357; Gogebic, 11,548,988; Vermillion, 6,260,574; Mesabi, 64,484,556; Total, 106,268,728.

Bureau of Corporations' Data

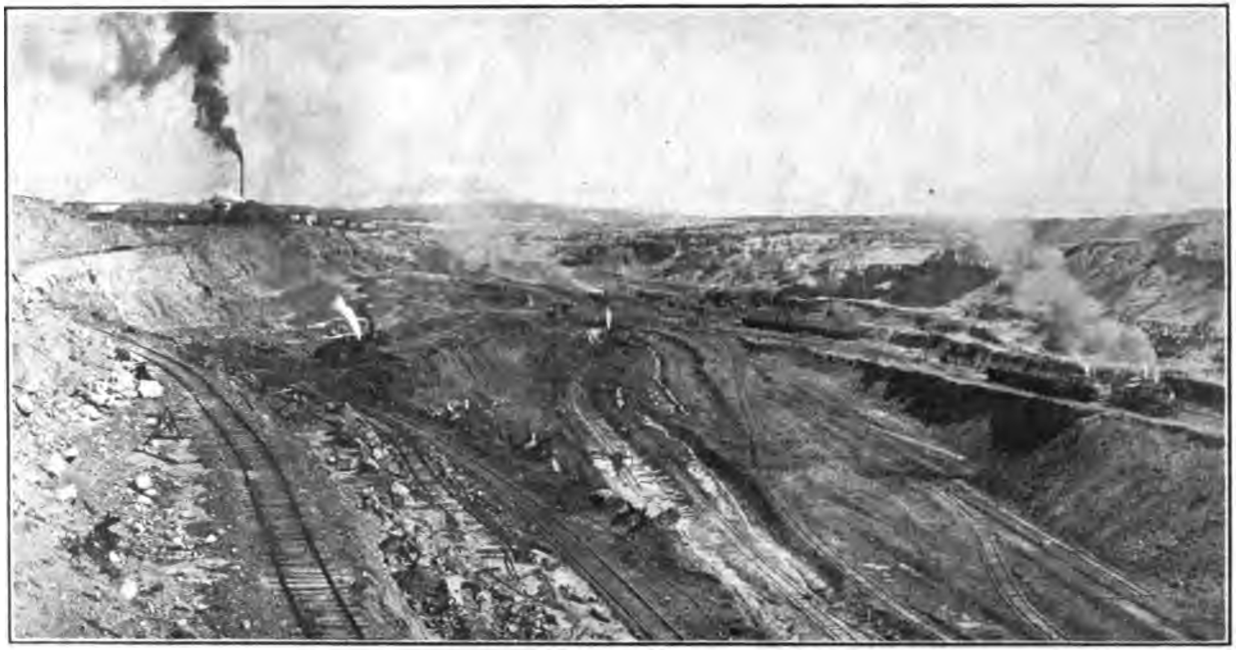
In the preliminary report on Cost of Production, which forms Part II of the Report of the Commissioner of Corporations on the Steel Industry, there are included on various pages a number of tables, with other scattered data, relating to the cost of Lake Superior ores.

The first table presented, reproduced here as Table I, covers the average costs during the years 1902 to 1906, inclusive, of a number of the more important companies mining iron ores in the Lake district.

There is nothing in or near the table, as originally printed, to show what the "general charges", near the foot of the column, are intended to cover. But in a later part of the volume it is casually explained that they represent general administration, depreciation and taxes. If this is so, they should properly be placed along with the other costs at the mines, as Finlay has done in his tables. The total costs at mine should therefore be increased from 10 to 34 cents per ton above those given under that heading in the preceding table. This fact is to be particularly noted, because this table is the only one published by the Bureau of Corpora-

Table II—Comparison of Lake Ore Costs, 1902-1906, and 1907-1910

	1902-1906. Tons.	1907-1910. Tons.
Tonnage covered by data	88,082,551	88,833,156
Labor costs	$0.43	$0.35
Other mining costs	0.21	0.20
Stripping and development	0.03	0.11
Depreciation	0.13	0.13
Royalties	0.25	0.29
Total costs at mines	$1.05	$1.08
Rail freight	0.70	0.74
Water freight	0.74	0.72
Total cost at lower lake ports	$2.49	$2.54
General charges	0.09	0.16
Total book cost	$2.58	$2.70



Open Pit of Fayal Mine, Mesabi Range

tions which gives the costs on the Michigan ranges separate from those of the Mesabi and Vermillion, and it is therefore the only bureau table which can be compared directly with the data published by Finlay for the Michigan Tax Commission.

The second table requiring attention is one comparing the costs for the Steel Corporation and two other large companies for the two periods respectively 1902-1906 and 1907-1910. It is here presented as Table II.

This comparison of the conditions, during the two periods named, was evidently taken up for a particular purpose, and the result was either pathetic or humorous, according to the point of view. The table did not show that royalties had been raised considerably during the later period, but it did show that the bulk of the increase in ore costs was due to increased taxation. Aside from this point, the data presented are somewhat more detailed than those in Table I, but unfortunately the different ranges are not given separately.

Table III—Costs Per Ton of Steel Corporation Ore, 1910

Ranges.	Mesabi.	Vermillion.	All Lake Ranges.
Tonnage covered by data	17,875,059	1,338,110	23,010,216
Labor costs	$0.21	$0.57	$0.35
Other operating costs	0.50	0.49	0.52
Royalties	0.34	0.39	0.34
Total costs at mine	$1.05	$1.45	$1.21
Rail freights	0.80	0.99	0.74
Water freights	0.76	0.76	0.75
Total costs at lower lake ports	$2.61	$3.20	$2.70
General charges	0.18	0.17	0.18
Total book costs	$2.79	$3.37	$2.88

A third set of tables remains to be noted. These are combined here as Table III, and cover the costs of ore to the United States Steel Corporation during the year 1910.

The three tables so far presented embody all the data as to direct costs included in the reports of the Bureau of Corporations as published to date. It is to be noted that at various places in the preliminary report on Cost of Production, supplementary data are given as to the profits of the railroad and water freight lines, and that these profits are deducted from total ore costs so as to give what the Bureau terms "integration costs". These integration costs represent merely what ore would cost a steel company if it owned and operated not only the mines, but the transportation systems, and charged no profit or interest on its transportation investment. Fortunately this method of accounting is not generally adopted, for it would have surprising and serious results for the investor, and this phase of the subject may be dropped without further comment for the moment, though it may be profitable to recur to the matter somewhat later.

The data furnished by the Bureau of Corporations having been summarized, it is now possible to compare with them certain figures presented by the Michigan Tax Commission, which in part cover the same ground, but which were prepared under the direction of an eminent mining engineer.

Michigan Tax Commission Data

In 1911, the State Board of Tax Commissioners of Michigan selected J. R. Finlay to appraise all of the mining properties of the states, the appraisal to serve as a basis for taxation of such properties. Mr. Finlay's report on this appraisal, dated Aug. 18, 1911, has since been published as a state document. In the course of this work, C. K. Leith was employed by Mr. Finlay to make examinations of the iron ore mines of the state, with special reference to their reserve tonnages. Mr. Leith's report on this phase of the matter is quoted from extensively in the state document, and is published separately in a revised and more detailed form by the United States Geological Survey. The Leith report is mentioned for completeness of reference, but may be disregarded here, as it contains no data as to costs of mining.

The Finlay report, however, contains a large amount of detailed and interesting data relating to mining costs and profits. The cost data have been collected and re-arranged so as to be more suitable for comparison with the bureau figures, and are here presented in Table IV. Most of the figures in this table are taken directly from the Finlay report, where they were already reduced to a basis of cost per ton of ore. The items of royalties and taxes, however, were quoted in bulk sums in the original report, and these have accordingly been reduced to a tonnage basis and placed in their proper places in the table. With these exceptions, no liberties have been taken with the figures as originally presented by Mr. Finlay.

The Finlay data were taken directly from the books of the various companies; they cover the five years, 1906-1910, inclusive; and include all of the iron ore produced in the state of Michigan during that time. Regarding the figures, Mr. Finlay says:

"It is well to explain that the cost statements will show some inevitable differences in detail. Until all the mines keep their books in exactly the same way, this is to be expected; but on the whole the variations are not very great. They mainly arise from the fact that one company may charge its expenditure for certain kinds of construction directly to mining, while another company might put such expenditures into a separate account, calling it 'construction'. In the same way, there are certain variations in amounts charged to general expense, explorations, etc. The student of mining costs will have no difficulty in seeing what the statements mean in each case."

As to one particular item—explorations—he further says: "This title in the cost statements usually refers to a general campaign of search for ore by some of the larger companies. This work may or may not be on lands owned by the company. It is a practice to take options on likely pieces of land and spend money for geological research and explorations by drilling or test pitting. I have thought it fair to allow the companies who conduct their business in this manner for the cost per ton of all this work. It is spread uniformly over the tonnage produced by all the mines of such operating companies for the past five years.

Table IV—Mining Costs on Michigan Ranges (Finlay)

Group.	1.	2.	3.	4.	5.	6.	7.	8.	9.
Mining expenses...	$1.355	$1.300	$0.956	$1.128	$1.280	$1.670	$1.330	$1.580	$0.660
Construction, development and exploration	0.260	0.895	0.260	0.192	0.214	0.290	0.190	0.148	0.220
General expenses...	0.098	0.087	0.064	0.097	0.065	0.140	0.120	0.082	0.045
Royalties	0.379	0.211	0.238	0.238	0.183	0.064	0.163	0.257	0.118
Taxes	0.063	0.026	0.019	0.079	0.010	0.121	0.075	0.047	0.016
Total cost at mines.	$2.15	$2.52	$1.54	$1.73	$1.75	$2.08	$1.88	$2.11	$1.06
Rail freight.........	0.40	0.40	0.40	0.40	0.35	0.40	0.32	0.32	0.40
Water freight.......	0.71	0.54	0.57	0.60	0.61	0.60	0.65	0.65	0.60
Commissions	0.05	0.07	0.09	0.07	0.06	0.02	0.01	0.00	0.10
Total cost at lower lake ports...	$3.31	$3.53	$2.60	$2.80	$2.77	$3.10	$2.86	$3.08	$2.16

Tonnage Covered by Cost-Sheet Averages

Location of district.	Tons Mined.	Tons Shipped.	Tons Sold.
1. Gogebic range, Gogebic county......	15,711,053	15,393,642	15,183,842
2. Iron River district, Iron county....	3,999,457	3,820,308	3,848,325
3. Crystal Falls district, Iron county..	6,777,255	6,119,177	6,050,662
4. Menominee dist., Dickinson county	10,052,564	9,335,812	9,391,360
5. West'n Marquette range, Baraga co.	744,603	657,370	657,370
6. Marquette hard ore, Marquette co.	4,078,863	3,888,557	3,873,785
7. Marquette soft ore, Marquette co.	11,354,811	10,830,611	10,744,791
8. Swanzy district, Marquette county..	2,095,723	1,670,263	1,669,737
9. Scattered low-grade mines.........	1,293,658	1,179,719	1,171,024
Total tonnage covered...........	56,107,987	52,895,459	52,590,896

I assume also that this expense will be continued, and consequently allow the same charge in my estimates for future cost."

With these brief explanations as to the source and meaning of the data, the summaries as to costs per ton, by iron-mining districts, is here presented as Table IV.

In comparing the cost data presented by Mr. Finlay with those published by the Bureau of Corporations, a few brief notes as to their respective scope and grouping may aid in clearing up apparent differences. The main points to be borne in mind in this connection are as follows:

(1) The Finlay data cover all the iron ore output of Michigan during the years 1906-1910, inclusive; while the Bureau data in the first three columns of Table I cover the output of a number of the larger companies for the years 1902-1906.

Table V—Comparison of Cost Data, Gogebic Range

	Bureau of Corporations.	J. R. Finlay.
Years covered	1902-1906.	1906-1910.
Tonnage covered	11,548,988	15,711,053
Labor and other mining costs	$1.31	$1.35
Exploration, construction, etc.	——	0.26
Royalties	0.39	0.38
Administration, taxes, etc.	0.22	0.16
Freights and commissions	1.17	1.16
Total cost at lower lake ports	$3.09	$3.31

(2) Table II shows that there was a slight increase in average royalties during later years, and a substantial increase in taxes. The Finlay costs may therefore be expected to range from 5 cents to 15 cents above the Bureau costs for these reasons alone, provided they were otherwise taken on the same basis.

(3) The Finlay data undoubtedly cover a larger number of the smaller mines, as well as a greater proportion of

merchant ore tonnage, than do the Bureau figures.

(4) The item of "mining expenses" in Table IV is roughly equivalent to the two items "labor costs" and "other mining costs" in Table I. On the other hand, the item "general charges" in Table I probably covers almost exactly the same ground as the two items "general expenses" and "taxes" in Table IV.

(5) As to Finlay's allowance for exploration, while it is certainly legitimate from either a mining or an accounting standpoint, it is possible enough that it was not included by the Bureau investigators, though there is no direct evidence on this point one way or the other. The "commissions" item was also probably disregarded, as the bulk of the tonnage figured on by the Bureau was not merchant ore.

It would, of course, be possible, by re-calculating the totals, to compare the results of the two investigations on all three of the Michigan ranges, but it hardly seems worth while to undertake this. The data regarding the Gogebic range are, however, in shape for direct comparison, and this has been done in Table V. In making this comparison, some of the items have been re-arranged so as to make the matter a little clearer.

If the relation brought out by Table V exists throughout the entire series, it is evident that the differences between the two sets of costs are due rather to difference in arrangement of the items than to serious differences in the items themselves. The question as to the exploration and development charges is brought into prominence, as this seems to be a possible explanation of some of the larger divergences between the two series of figures.

*Average Iron of Bessemer Ores**

Gogebic Range

Year	Tonnage	Average Iron (Natural)	Average Phosphorus	Average Moisture	Per Cent of Bessemer
1912..........	3,026,430	54.2386	0.04100	10.8269	64.1
1911..........	1,719,686	54.5312	0.04000	10.9568	73.3
1910..........	3,183,563	54.1441	0.04122	....	80.0
1909..........	2,761,307	53.6578	0.04227	....	73.9
1908..........	1,843,612	53.9843	0.04185	....	72.5
1907..........	2,640,746	53.8365	0.04112	....	81.1
1906..........	2,892,254	54.2732	0.04162	....	85.3
1905..........	3,154,126	54.7369	0.04093	....	90.2
1904..........	1,960,165	55.2144	0.04002	....	86.6
1903..........	2,275,548	55.9185	0.03889	....	84.8
1902..........	2,796,545	55.7324	0.04184	....	87.5

Marquette Range

Year	Tonnage	Average Iron (Natural)	Average Phosphorus	Average Moisture	Per Cent of Bessemer
1912..........	540,826	54.9180	0.04033	9.8810	15.0
1911..........	772,911	54.0668	0.03746	9.3922	31.1
1910..........	995,392	55.0838	0.04490	....	25.5
1909..........	950,426	57.1386	0.04539	....	25.8
1908..........	713,809	55.9672	0.04485	....	32.7
1907..........	925,111	56.7992	0.04539	....	24.1
1906..........	1,064,631	56.5151	0.04851	....	27.3
1905..........	1,059,980	57.5585	0.04616	....	27.1
1904..........	796,706	58.6219	0.04296	....	30.1
1903..........	1,072,978	57.2475	0.04488	....	38.5
1902..........	1,054,757	58.2631	0.04239	....	29.9

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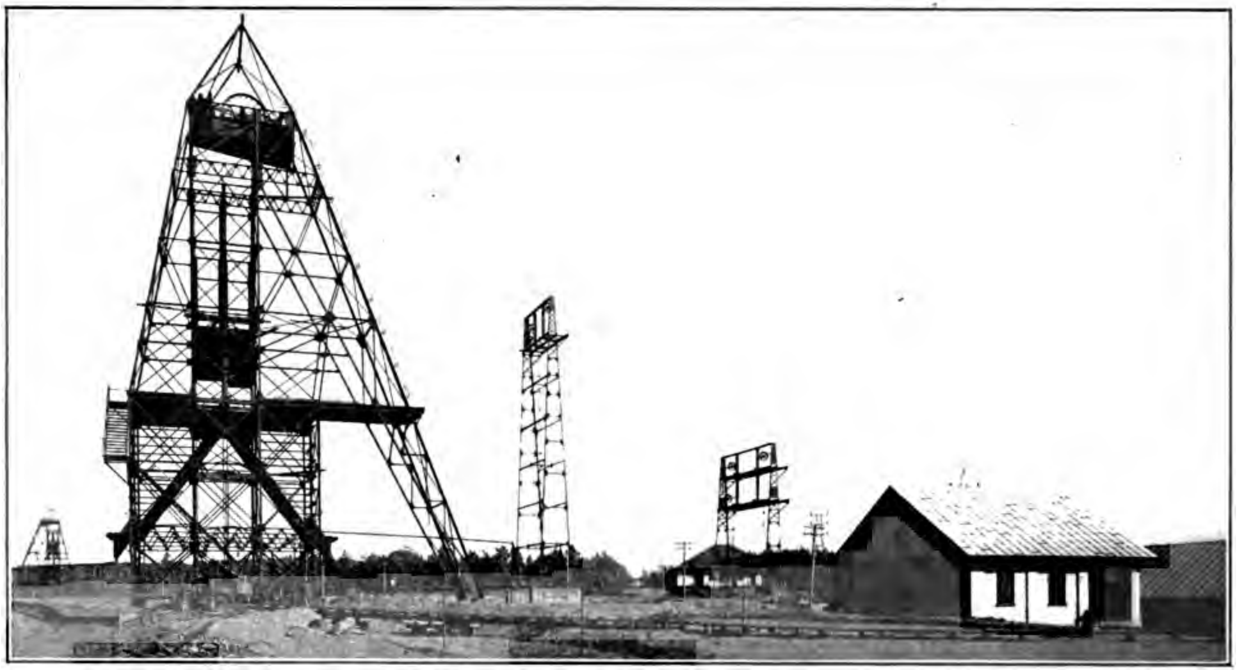
*Compiled by W. L. Tinker, Secretary Lake Superior Iron Ore Association.



Morris Mine, Marquette Range, Showing Steel Headframe

Menominee Range

Year	Tonnage	Average Iron (Natural)	Average Phosphorus	Average Moisture	Per Cent of Bessemer
1912..........	85,389	55.2117	0.02522	7.0276	2.5
1911..........	105,643	54.5578	0.03302	7.3354	3.7
1910..........	185,775	53.6310	0.04323	....	5.0
1909..........	311,257	53.2389	0.04180	....	7.4
1908..........	84,703	55.6941	0.03457	....	4.0
1907..........	161,765	56.6136	0.03425	....	4.3
1906..........	234,732	55.8979	0.03630	....	6.0
1905..........	160,727	56.8037	0.03197	....	4.6
1904..........	102,381	57.5432	0.02687	....	4.2
1903..........	104,669	57.7853	0.02084	....	4.0
1902..........	86,018	57.7141	0.01674	....	2.8

Vermillion Range

Year	Tonnage	Average Iron (Natural)	Average Phosphorus	Average Moisture	Per Cent of Bessemer
1912..........	1,369,602	59.3095	0.03847	5.7806	74.9
1911..........	890,419	59.5940	0.03837	5.2695	82.8
1910..........	933,147	60.1133	0.03745	....	78.2
1909..........	896,690	60.3218	0.03904	....	81.7
1908..........	698,696	60.4392	0.03913	....	83.9
1907..........	1,545,834	60.1411	0.03750	....	92.6
1906..........	1,595,321	60.1254	0.03934	....	89.3
1905..........	1,413,007	60.6082	0.03857	....	85.7
1904..........	1,199,684	60.0113	0.04031	....	94.5
1903..........	1,403,998	60.4775	0.04098	....	84.6
1902..........	1,639,108	61.5522	0.03983	....	80.1

Total Old Range

Year	Tonnage	Average Iron (Natural)	Average Phosphorus	Average Moisture	Per Cent of Bessemer
1912..........	5,022,247	55.7112	0.04000	9.2751	37.2
1911..........	3,488,659	55.7213	0.03881	9.0489	39.9
1910..........	5,297,877	55.3540	0.04132	....	41.5
1909..........	4,919,680	55.5184	0.04226	....	38.8
1908..........	3,340,820	55.8013	0.04174	....	43.6
1907..........	5,273,456	56.2895	0.04060	....	42.1
1906..........	5,786,938	56.3648	0.04204	....	44.4
1905..........	5,787,840	56.7445	0.04106	....	46.3
1904..........	4,058,936	57.3598	0.04035	....	47.3
1903..........	4,857,193	57.5701	0.04043	....	49.9
1902..........	5,576,428	57.9523	0.04097	....	47.4

Mesabi Range

Year	Tonnage	Average Iron (Natural)	Average Phosphorus	Average Moisture	Per Cent of Bessemer
1912..........	13,996,278	53.2513	0.04685	10.3739	45.3
1911..........	10,608,310	52.9224	0.04620	10.6586	49.3
1910..........	13,164,962	53.3587	0.04608	....	46.3
1909..........	13,391,617	53.2625	0.04528	....	48.0
1908..........	9,788,068	54.0142	0.04459	....	57.2
1907..........	16,488,531	54.0681	0.04558	....	63.2
1906..........	15,988,550	54.6196	0.04408	....	69.0
1905..........	13,914,139	55.3543	0.04215	....	70.1
1904..........	9,306,695	56.3171	0.04010	....	79.9
1903..........	9,451,328	55.8573	0.04044	....	74.9
1902..........	10,618,878	56.6690	0.03948	....	80.6

Total Bessemer

Year	Tonnage	Average Iron (Natural)	Average Phosphorus	Average Moisture	Per Cent of Bessemer
1912	19,018,525	53.9009	0.04504	10.0862	41.9
1911	14,096,969	53.6151	0.04438	10.2602	46.6
1910	18,462,839	53.9313	0.04472	....	44.8
1909	18,311,297	53.8686	0.04446	....	45.1
1908	13,128,888	54.4690	0.04387	....	53.0
1907	21,761,987	54.6064	0.04437	....	56.4
1906	21,775,488	55.0834	0.04354	....	60.2
1905	19,701,979	55.7627	0.04183	....	60.9
1904	13,365,631	56.6337	0.04018	....	65.1
1903	14,308,521	56.4388	0.04043	....	63.7
1902	16,195,306	57.1109	0.03995	....	64.9

Total Non-Bessemer

Year	Tonnage	Average Iron (Natural)	Average Moisture
1912	25,346,575	50.5043	11.9299
1911	16,158,469	50.3792	11.8114
1910	22,709,304	50.5574	....
1909	22,271,108	50.6696	....
1908	11,645,680	51.2484	....
1907	16,812,149	51.8434	....
1906	14.403,682	52.0235	....
1905	12,651,496	52.8077	....
1904	7,164,088	53.6115	....
1903	8,049,355	53.8449	....
1902	8,735,395	54.5778	....

Average Iron (Natural) of Non-Bessemer Ores

Gogebic Range

Year	Tonnage	Average Iron (Natural)	Average Moisture
1912...	1,691,851	53.2912	11.0214
1911...	625,237	52.9294	11.6417
1910...	793,953	52.5195	....
1909...	973,405	51.9749	....
1908...	698,062	52.2528	....
1907...	614,512	52.5835	....
1906...	497,539	51.8580	....
1905...	339,972	52.1136	....
1904...	303,647	53.1802	....
1903...	405,797	52.3980	....
1902...	397,726	53.7872	....

Marquette Range

Year	Tonnage	Average Iron (Natural)	Average Moisture
1912...	3,058,000	52.7308	10.9176
1911...	1,712,619	52.4737	10.7352
1910...	2,904,774	52.7952	....
1909...	2,724,318	52.9033	....
1908...	1,465,357	52.2748	....
1907...	2,912,995	52.9362	....
1906...	2,838,201	53.9861	....
1905...	2,853,024	54.3907	....
1904...	1,848,429	54.7825	....
1903...	1,715,304	54.0844	....
1902...	2,464,187	55.1032	....

Menominee Range

Year	Tonnage	Average Iron (Natural)	Average Moisture
1912...	3,252,805	51.0527	7.9620
1911...	2,729,715	51.4315	7.9469
1910...	3,489,460	51.0734	....
1909...	3,861,127	51.3061	....
1908...	2,018,487	50.9742	....
1907...	3,588,366	51.4400	....
1906...	3,697,403	52.2508	....
1905...	3,290,402	52.8159	....
1904...	2,296,537	53.7339	....
1903...	2,500,897	53.8048	....
1902...	2,919,762	54.1020	....

Average Iron (Natural) of Non-Bessemer Ores—Continued

Vermillion Range

Year	Tonnage	Average Iron (Natural)	Average Moisture
1912...	457,332	58.7775	4.7197
1911...	185,116	59.5984	4.0908
1910...	259,268	60.2483	....
1909...	200,437	61.2379	....
1908...	134,231	61.2246	....
1907...	122,215	63.9432	....
1906...	190,550	64.5798	....
1905...	235,603	64.3330	....
1904...	70,005	66.4676	....
1903...	255,934	62.9809	....
1902...	406,784	61.9984	....

Total Old Range

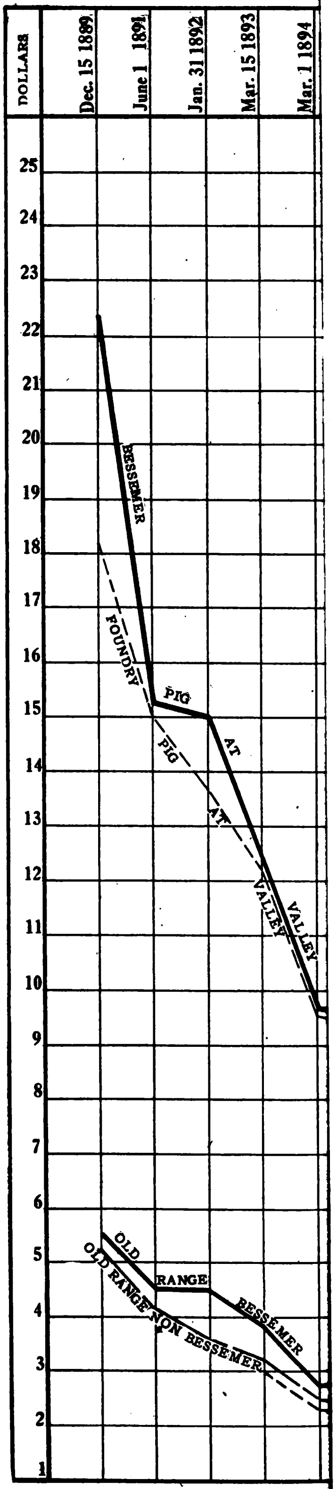
Year	Tonnage	Average Iron (Natural)	Average Moisture
1912...	8,459,988	52.5245	9.4668
1911...	5,252,687	52.2184	9.1599
1910...	7,447,455	51.2185	....
1909...	7,759,287	52.2074	....
1908...	4,316,137	51.9414	....
1907...	7,238,088	52.3503	....
1906...	7,223,693	53.2308	....
1905...	6,719,001	53.8529	....
1904...	4,518,618	54.3229	....
1903...	4,877,932	54.2675	....
1902...	6,188,459	54.9995	....

Mesabi Range

Year	Tonnage	Average Iron (Natural)	Average Moisture
1912...	16,886,587	49.4922	13.1639
1911...	10,905,782	49.4934	13.0884
1910...	15,261,849	49.7468	....
1909...	14,511,821	49.8474	....
1908...	7,329,543	50.8403	....
1907...	9,574,061	51.4601	....
1906...	7,179,989	50.8088	....
1905...	5,932,495	51.6239	....
1904...	2,645,470	52.3964	....
1903...	3,171,423	53.1948	....
1902...	2,546,936	53.5531	....

Iron Content of Total Bessemer and Non-Bessemer Ores

Old Range			*Mesabi Range*			*All Ranges*		
Year	Tonnage	Average Iron (Natural)	Year	Tonnage	Average Iron (Natural)	Year	Tonnage	Average Iron (Natural)
1912	13,482,235	53.7116	1912	30,882,865	51.1958	1912	44,365,100	51.9603
1911	8,741,346	53.6164	1911	21,514,092	51.1842	1911	30,255,438	51.8869
1910	12,745,332	53.5219	1910	28,426,811	51.4195	1910	41,172,143	52.0703
1909	12,678,967	53.4921	1909	27,903,438	51.4864	1909	40,582,405	52.1130
1908	7,656,957	53.6255	1908	17,117,611	52.6552	1908	24,774,568	52.9551
1907	12,511,544	54.0103	1907	26,062,592	53.1100	1907	38,574,136	53.4020
1906	13,010,631	54.6248	1906	23,168,539	53.4386	1906	36,179,170	53.8552
1905	12,506,841	55.1910	1905	19,846,634	54.2392	1905	32,353,475	54.6072
1904	8,577,554	55.7600	1904	11,952,165	55.4493	1904	20,529,719	55.5791
1903	9,735,125	55.9153	1903	12,622,751	55.1884	1903	22,357,876	55.5049
1902	11,764,887	56.3991	1902	13,165,814	56.0663	1902	24,930,701	56.2233


DOLLARS
Dec. 15 1889
June 1 1891
Jan. 31 1892
Mar. 15 1893
Mar. 1 1894
25
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2
1
BESSEMER
PIG
AT
VALLEY
FOUNDRY
PIG
AT
VALLEY
OLD
RANGE
BESSEMER
OLD RANGE NON BESSEMER

Chart

Ore Prices for 24 Years

For a number of years the announcement of new prices of lake ore has come as a surprise, or at least with some unexpected features. In 1912, the unexpected feature was the reduction of the prices 10 cents below those prevailing in 1911, as it was confidently expected that the full 1911 prices would again prevail. No meetings of ore sellers were held last year and the consideration of ore prices was conducted in an entirely informal manner, in striking contrast with the animated discussions that took place years ago at the meetings of the ore men.

In 1911, the selling of ore for the season was precipitated on April 21, by the receipt of a telegram to THE IRON TRADE REVIEW, stating that the W. P. Snyder interests, of Pittsburgh, had sold 550,000 tons at a reduction of 50 cents from the prices of 1910, in which year, also, Mr. Snyder had fixed the prices. In March, 1912, the activity of Mr. Snyder hastened the opening of the market, but the first sales were made by Pickands, Mather & Co., who also opened the market for 1913 on Tuesday, Nov. 19, 1912, by the sales of several million tons at 10 cents below the 1911 prices.

On April 27, 1911, in publishing the new prices, THE IRON TRADE REVIEW said:

"One of the very interesting features of the new price schedule is that it practically wipes out the differential against the Mesabi ores. In the early days of Mesabi ores, furnace men were strongly prejudiced against them because of their fineness of structure and because it was believed that they were responsible for many slips. At first, Mesabi ores were almost a drug on the market, and in 1893 the differential was 85 cents, as old range Bessemer sold at $3.85 and Mesabi at $3. In 1894, the differential was 40 cents and it varied from 35 to 75 cents for five years up to 1900, when it became $1 and continued at $1 in 1901 and 1902. In 1903, the differential was 50 cents and since that time it has been 25

Selling Price of Iron Ore and Price of Pig Iron at Date of Buying Movement

		Season Iron Ore Prices				Iron Prices Valley	
Season.	Date Buying Movement.	Old Range Bessemer.	Mesabi Bessemer.	Old Range Non-Bessemer.	Mesabi Non-Bessemer.	Bessemer.	Foundry Iron No. 2.
1890	Dec. 15, 1889	$5.50	No Sale	$5.25	No Sale	$22.15	$18.15
1891	June 1, 1891	4.50	No Sale	4.25	No Sale	15.15	15.00
1892	Jan. 31, 1892	4.50	No Sale	3.65	No Sale	15.00	13.65
1893	March 15, 1893	3.85	$3.00	3.20	No Sale	12.65	12.15
1894	March 1, 1894	2.75	2.35	2.50	No Sale	9.65	9.65
1895	April 1, 1895	2.90	2.15	2.25	$1.90	9.40	9.40
1896	May 1, 1896	4.00	3.50	2.70	2.25	12.40	11.15
1897	May 20, 1897	2.60	2.25	2.15	1.90	8.35	8.40
1898	March 20, 1898	2.75	2.25	1.85	1.75	9.55	9.80
1899	Feb. 1, 1899	3.00	2.40	2.15	2.00	10.30	9.75
1900	Dec. 15, 1899	5.50	4.50	4.25	4.00	24.15	22.15
1901	April 15, 1901	4.25	3.25	3.00	2.75	16.15	14.40
1902	Feb. 1, 1902	4.25	3.25	3.25	2.75	15.90	15.90
1903	March 20, 1903	4.50	4.00	3.60	3.20	21.50	21.65
1904	April 15, 1904	3.25	3.00	2.75	2.50	13.35	13.15
1905	Feb. 1, 1905	3.75	3.50	3.20	3.00	15.50	16.00
1906	Dec. 5, 1905	4.25	4.00	3.70	3.50	17.25	17.25
1907	Nov. 5, 1906	5.00	4.75	4.20	4.00	21.50	21.50
1908	June 15, 1908	4.50	4.25	3.70	3.50	16.00	15.00
1909	May 10, 1909	4.50	4.25	3.70	3.50	14.75	14.25
1910	Dec. 24, 1909	5.00	4.75	4.20	4.00	19.00	17.25
1911	April 21, 1911	4.50	4.25	3.70	3.50	15.00	13.75
1912	March 20, 1912	3.75	3.50	3.00	2.85	14.25	13.25
1913	Nov. 19, 1912	4.40	4.15	3.60	3.40	17.25	17.50

cents. The new schedule still apparently preserves the 25-cent differential, but in reality it is only 5 cents, because, on account of the reduction in freight rates on the Minnesota roads, Mesabi ores can be delivered at lower lake ports for 20 cents less than in past years.

"These figures are based on the official quotations of base ores. In some cases, however, when the finer grained Mesabi ores were first coming into the market, there was a spread of $1.25 in prices, in favor of the popular old range ores. In 1900, the differential between some high grade old range Bessemer and certain Mesabi ores of fine structure ranged from $1.40 to $1.90."

In 1912, there was a differential of 25 cents between the old range and Mesabi Bessemers, and 20 cents between the old range and Mesabi non-Bessemers. This was again adopted in the 1913 schedule.

Dates of Buying Movement

Price concessions have been made almost every year from the so-called official Lake Superior ore prices and this was true particularly of the non-Bessemer ores in 1912, although the schedule for that year was the lowest announced since April 15, 1904. The buying season for 1907 was the earliest on record, as it started on Nov. 5, just two weeks earlier than in 1912, and within a week practically all the ores for sale had been disposed of. Next to the early buying movement of the year 1907 came the years 1906, with Dec. 5, 1905, as the date of the buying movement, and 1890 and 1900, each with Dec. 15 of the previous year as the date of the height of the buying movements. Three years—1899, 1905 and 1909—were, like 1912, characterized by two buying movements. The year 1908 is conspicuous in the history of the ore trade on account of the refusal of buyers to accept the prices named in February of that year, when the 1907 prices were re-affirmed for 1908. Owing to furnaces refusing to place their orders, prices were reduced 50 cents per ton on June 15, 1908. The buying movement which then started was the latest on record. In 1909, many reservations were made during the early months and there was little actual buying, but prices were not determined until May 10. In 1910, all the Bessemer ore available was reserved before prices were established and reservations were quickly turned into actual sales when prices were announced. Some non-Bessemer ore also was sold early, but sales of the remaining tonnage dragged throughout the year. The ore market in 1912 moved rather slowly at the beginning, but the ore was rapidly disposed of during the spring and early summer, after the improvement in business got well under way. The second buying movement of the year, that for 1913 delivery, started with heavy reservations of steel companies being

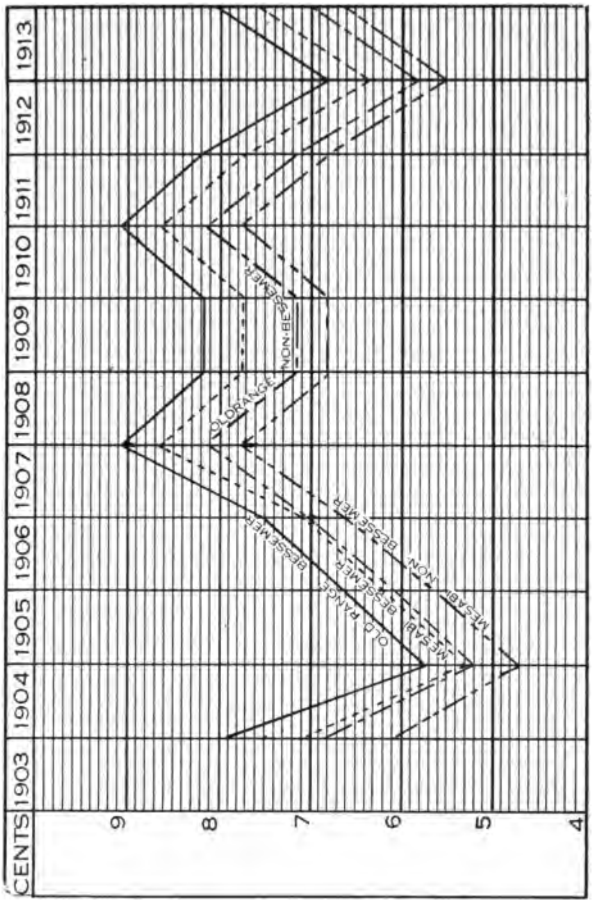


Chart II—Fluctuations by Unit Value

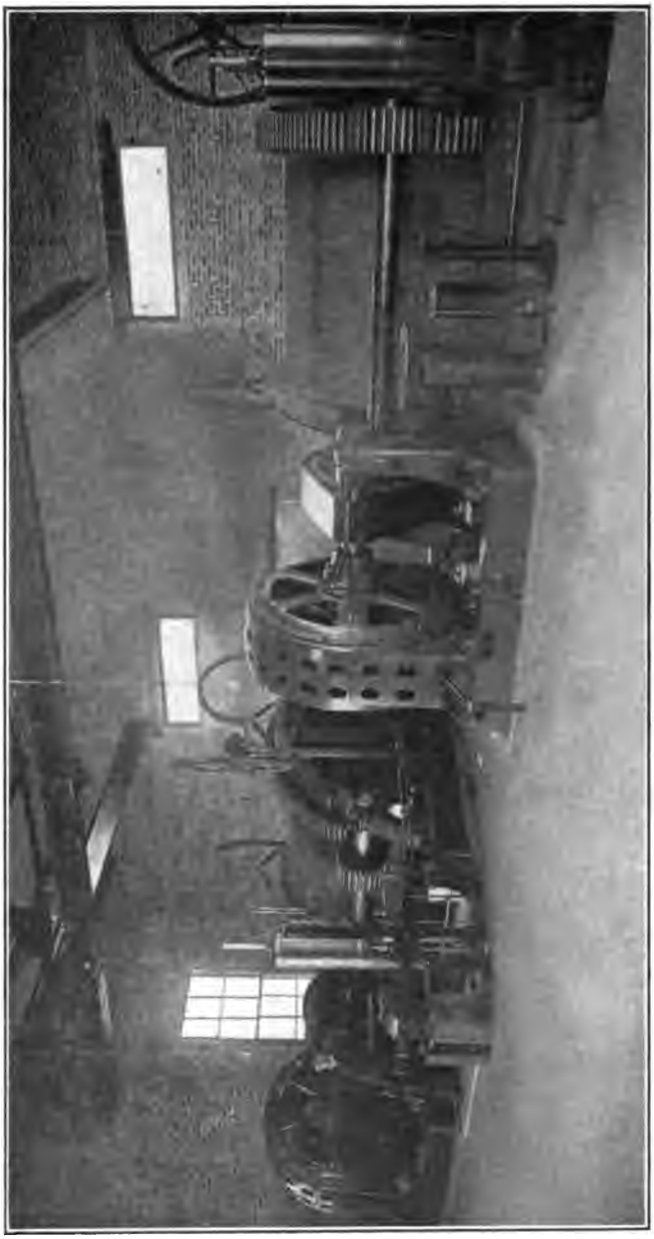
converted into contracts, but the merchant furnaces bought rather slowly. The sales footed up a very large tonnage, however, and, in the spring of 1913, the unsold tonnage was not large, consisting mostly of low grade ores.

The accompanying chart, No. I, shows the prices at which iron ore has sold during the 24 years beginning Dec. 15, 1889, together with the prevailing valley prices of Bessemer and No. 2 foundry pig iron at the date at which the ore buying movement was at its height. The idea, which was first embodied in the chart form in the issue of The Iron Trade Review of Feb. 21, 1907, is to establish in a graphic manner the relation of the raw material price to that of pig iron. During the past years, up to 1909, barring some slight irregularities, the two series of lines have approached nearly to being parallel, showing that ore prices have declined with the prices of iron. This was not true in 1909, when the lines representing pig iron prices had a downward tendency while those for iron ore prices continued straight. In 1910, when ore prices were fixed, the lines for both pig iron and ore had an upward tendency, but later, in 1910, pig iron started downward and continued to decline throughout the year, the decline in Bessemer being $4.

At the time of the fixing of ore prices in April, 1911, and March, 1912, the downward tendency was common to both pig iron and iron ore, and at the time of the fixing of prices in November, 1912, the tendency of both was upward.

The table (page 43), showing the rise and decline of old range Bessemer ore and Bessemer pig iron from 1903 to 1913, discloses some interesting statistics. In 1911, the decline in pig iron was 21.1 per cent, while in ore it was 10 per cent. In 1912, on the other hand, ore declined 16.7 per cent and pig iron only 5 per cent. At the time of fixing the prices for 1913, the advance in ore was 17.3 per cent, and in pig iron, 21.1 per cent.

Chart No. II shows the fluctuations of the four classes of ore according to the value of the units of iron in the natural state. For the years preceding 1907, the guarantee of Bessemer ores was



Electric Skip and Cage Hoists, Lloyd Mine, Marquette Range

55.70 per cent natural and for the non-Bessemer ores it was 52.80 per cent, except Mesabi non-Bessemer for 1905 and 1906, when the natural iron content was 53 per cent. Before the sales for delivery in 1907 were made, the natural iron content for the base was changed to 55 per cent for Bessemers and 51.50 per cent for non-Bessemers. No change has since been made. The fluctuations in the unit prices have been as follows:

Values of Unit of Iron for 11 Years

	Old Range		Mesabi	
	Bessemer. Cents.	Non-Bessemer. Cents.	Bessemer. Cents.	Non-Bessemer. Cents.
1903	7.94	6.82	7.05	6.06
1904	5.73	5.21	5.29	4.73
1905	6.61	6.06	6.17	5.66
1906	7.50	7.01	7.05	6.60
1907	9.09	8.16	8.64	7.77
1908	8.18	7.18	7.73	6.80
1909	8.18	7.18	7.73	6.80
1910	9.09	8.16	8.64	7.77
1911	8.18	7.18	7.73	6.80
1912	6.82	5.83	6.36	5.53
1913	8.00	6.99	7.55	6.60

Fluctuations of iron ore prices expressed in values of units of iron in natural state.

*Total Shipments from All Ranges**

Year.	Gross Tons.	Year.	Gross Tons.
1844–1854	3,000	1884	2,506,814
1855	1,449	1885	2,516,201
1856	36,343	1886	3,559,371
1857	25,646	1887	4,742,276
1858	15,876	1888	5,046,503
1859	68,832	1889	7,292,644
1860	114,401	1890	9,003,701
1861	49,909	1891	7,071,053
1862	124,169	1892	9,081,285
1863	203,055	1893	6,129,276
1864	243,127	1894	7,759,753
1865	236,208	1895	10,445,509
1866	278,796	1896	9,947,972
1867	473,567	1897	12,475,120
1868	491,449	1898	14,042,824
1869	617,444	1899	18,271,535
1870	830,940	1900	19,080,379
1871	779,607	1901	20,615,907
1872	900,901	1902	27,585,904
1873	1,162,458	1903	24,329,710
1874	919,557	1904	21,849,401
1875	891,257	1905	34,384,116
1876	992,764	1906	38,565,762
1877	1,015,087	1907	42,266,668
1878	1,111,110	1908	26,014,987
1879	1,375,691	1909	42,586,869
1880	1,908,745	1910	43,442,397
1881	2,307,005	1911	32,793,130
1882	2,965,412	1912	48,221,546
1883	2,352,840		

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*Includes rail shipments.

GRAND TOTAL **574,125,258**

Shipments of All Ranges in Graphic Form

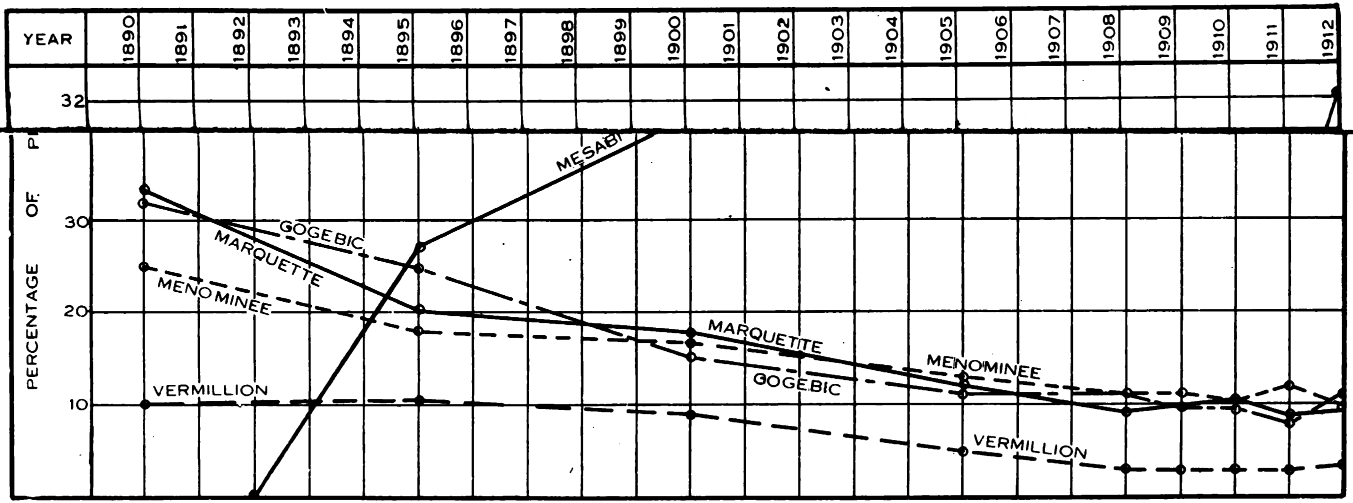


Chart III-Mesabi Shipments, 1892-1912; Old Range, 1890-1912; Percentage of Shipments by Five Year Periods, 1890-1905, and Yearly, 1908-1912.

Shipments from Each Mine in 1912

Mesabi Range

	Gross tons.		Gross tons.
Adams	993,523	Leonard	2,198,119
Adriatic	102,478	Leonard-Glen	15,932
Agnew	101,498	Lincoln	173,979
Albany	244,669	Mace	136,524
Alberta	1,455	Madeira	46,494
Bangor	130,997	Madrid	26,906
Bessemer	136,010	Mahoning	1,518,643
Biwabik	312,378	Malta	2,817
Bray	164,732	Meadow	10,629
Brunt	215,585	Miller	301,518
Canisteo	2,099,880	Minorca	37,235
Cavour	47,919	Mississippi	274,729
Chisholm	695,859	Mohawk	161,539
Clark	500,768	Monica	92,754
Commodore	576,855	Morris	395
Corsica	196,188	Morton	5,948
Crosby	188,368	Myers	101,558
Croxton	146,290	Pearson	75,969
Cyprus	100,063	Perkins	60,523
Dale	1,106,808	Pettit	157,208
Elba	168,990	Roberts	12,384
Elizabeth	392	Ruddy	36,551
Euclid	49,590	Sauntry-Alpena	1,025,301
Fayal	468,019	Schley	159,126
Fowler	204,584	Scranton	254,500
Franklin	69,993	Section 17	4,203
Genoa	1,315,840	Seville	6,023
Gilbert	135,622	Shenango	805,413
Grace	60,641	Sliver	378,541
Grant	399,848	Spruce	740,801
Hanna	211,822	St. Paul	42,597
Harold	187,926	Stevenson	682,514
Hawkins	473,120	Susquehanna	583,910
Hill	1,188,908	Union	213,829
Holman	919,699	Uno North	545,033
Hudson	224,548	Uno South	1,305,216
Hull-Rust	2,232,112	Utica	223,006
Humphrey	133	Virginia Group	619,594
Iroquois	80,000	Virginia (P., M. & Co.)	200,182
Kellogg	127,412	Wacootah	129,073
Kinney	530,080	Webb	166,636
Knox	101,169	Whiteside	275,915
La Belle	14,896	Williams (N. Cinci.)	39,274
Larkin (Tesora)	16,542	Winifred	91,806
La Rue	155,552	Woodbridge	68,089
Laura	270,411		
Leetonia	368,301	**Total**	**32,047,409**

Menominee Range

	Gross tons.
Aragon	244,894
Armenia	150,808
Baltic	100,736
Berkshire	33,419
Bristol (Claire)	435,619
Calumet	35,587
Caspian	306,913
Chapin	327,571
Chatham	134,079
Chicagon	149,619
Commonwealth (Buckeye)	49,964
Cortland	17,498
Crystal Falls	665
Davidson	126,207
Dunn	242,304
Florence	99,682
Fogarty	84,074
Genesee (Ethel)	4,248
Great Western	3,342
Groveland	14,320
Hemlock	126,132
Hiawatha	220,106
James	75,702
Loretto	136,045
McDonald	1,384
Millie	1,165
Munro	20,100
Penn. Iron Mining Co.	429,150
Pewabic	279,769
Ravenna	18,301
Riverton Group	177,496
Tobin	319,318
Virgil	2,996
Vivian	28,800
Wickwire	40,417
Youngs	83,528
Zimmerman	189,482
Total	4,711,440

Gogebic Range

	Gross tons.
Anvil	56,854
Ashland	211,927
Asteroid	70,240
Atlantic	142,080
Brotherton	148,930
Cary	308,292
Castile	136,703
Colby	245,195
Eureka	65,716
Harmony (Germania)	27,950
Iron Belt	2,808
Ironton	173,135
Montreal	247,772
Newport	973,391
Norrie Group	1,500,732
Ottawa (Odanah)	111,396
Palms	39,552
Pence	14,924
Plumer	47,578
Puritan	90,683
Sunday Lake	155,485
Tilden	158,151
Yale (West Colby)	76,772
Total	5,006,266

1912 SHIPMENTS

Marquette Range

	Gross tons.
American (Sterling)	133,306
Austin	102,530
Breitung Hematite	122,320
Cambria	69,904
Cleve. Cliffs Group	1,004,684
Empire	32,933
Imperial	54,053
Jackson	50,166
Lake Angeline	151,910
Lake Superior	219,673
Lillie	109,548
Lloyd	44,467
Lucy (McComber)	73,120
Maas	46,249
Mary Charlotte	260,801
Milwaukee-Davis	11,537
Mitchell	21,141
Morris	1,286
Negaunee	446,318
Princeton (Swanzey)	162,138
Queen Group	351,916
Republic	156,864
Richmond	118,554
Rolling Mill	115,784
Stegmiller	50,963
Stephenson	214,386
Volunteer	9,008
Washington	66,749
Total	**4,202,308**

Vermillion Range

	Gross tons.
Chandler	73,370
Pioneer	647,237
Savoy	90,528
Section 30	157,344
Sibley	309,076
Soudan	88,714
White Iron	30
Zenith	478,682
Total	**1,844,981**

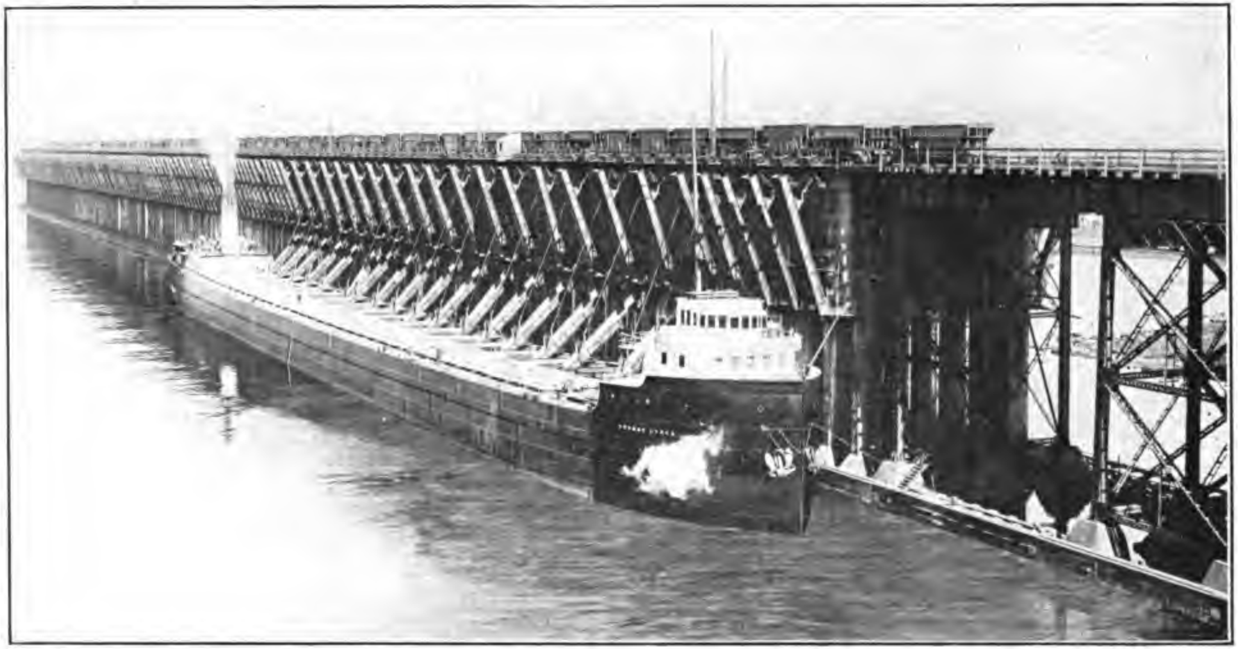
Cuyuna Range

	Gross tons.
Armour No. 1	49,539
Armour No. 2	49,031
Kennedy	196,653
Thompson	9,888
Total	**305,111**

Miscellaneous in Wisconsin

	Gross tons.
Iron Ridge	19,284
Mayville	84,747
Total	**104,031**

GRAND TOTAL **48,221,546**



New Dock of Great Northern Railway at Allouez Bay, Wisconsin

Record of Individual Mines Since Opening

Mines of the Mesabi Range

	1912.	1911.	1910.	1909.	Prior to 1909.	Totals.
Adams	993,523	411,268	1,258,295	1,829,372	10,756,456	15,248,914
Adriatic	102,478	73,280	135,685	107,317	181,610	600,370
Agnew	101,498	153,425	152,834	151,536	772,345	1,331,638
Albany	244,669	132,572	267,583	368,057	1,362,979	2,375,860
Alberta	1,455	22,108	25,404	....	82,175	131,142
Alexander	....	....	1,652	....	231,699	233,351
Bangor	130,997	119,508	17,673	....	....	268,178
Bessemer	136,010	179,051	117,173	227,767	529,086	1,189,087
Biwabik	312,378	211,071	544,353	542,821	8,578,748	10,189,371
Bray	164,732	....	57,789	65,514	....	288,035
Brunt	215,585	136,531	110,630	14,212	254,972	731,930
Burt	....	56,506	1,032,815	1,660,101	8,534,601	11,284,023
Canisteo	2,099,880	1,340,378	1,105,160	85,505	8,214	4,639,137
Cavour	47,919	1,104	....	....	....	49,023
Chisholm	695,859	721,784	634,236	314,597	1,632,396	3,998,872
Cincinnati	....	....	....	4,537	147,538	152,075
Clark	500,768	500,999	529,222	484,512	2,457,863	4,473,364
Commodore	576,855	294,787	341,548	409,148	1,792,706	3,415,044
Corsica	196,188	63,940	277,537	135,366	500,810	1,173,841
Crosby	188,368	18,439	159,569	183,470	494,722	1,044,568
Croxton	146,290	10,491	71,632	159,038	916,721	1,304,172
Cyprus	100,063	81,178	102,233	107,685	1,170,349	1,561,508
Dale	1,106,808	1,002,292	....	....	....	2,109,100

	1912.	1911.	1910.	1909.	Prior to 1909.	Totals.
Duluth	....	....	57,239	150,501	1,586,732	1,794,472
Elba	168,990	165,055	186,993	224,202	1,444,651	2,189,891
Elizabeth	392	36,268	7,214	....	....	43,874
Euclid	49,590	56,796	53,009	82,627	....	242,022
Fayal	468,019	434,364	1,485,099	1,879,357	16,253,193	20,520,032
Forest	....	....	8,264	6,304	233,972	248,540
Fowler	204,584	85,506	204,640	99,892	55,525	650,147
Franklin	69,993	66,351	31,614	51,393	1,660,615	1,879,966
Genoa	1,315,840	923,477	283,299	....	2,985,287	5,507,903
Gilbert	135,622	....	110,788	783,683	437,105	1,467,198
Glen	....	113,512	286,051	396,591	1,520,819	2,316,973
Grace	60,641	....	....	....	....	60,641
Grant	399,848	350,475	297,761	....	164,514	1,212,598
Hanna	211,822	26,252	308,009	238,873	....	784,956
Harold	187,926	281,293	27,711	....	....	496,930
Hartley	....	....	113,512	....	390,108	503,620
Hawkins	473,120	239,965	224,406	316,783	1,228,740	2,483,014
Hector (Hale)	....	20,624	82,393	30,726	387,610	521,353
Higgins	....	250	151,854	322,504	788,642	1,263,250
Hill	1,188,908	1,550,568	801,088	....	....	3,540,564
Holman	919,699	779,889	413,873	391,157	9,750	2,514,368
Hudson	224,548	67,278	168,553	....	....	460,379
Hull-Rust	2,232,112	496,977	3,189,975	3,039,911	11,999,260	20,958,235
Humphrey	133	....	8,227	25,348	....	33,708
Iroquois	80,000	43,310	231,842	152,510	725,257	1,232,919
Jennings	....	....	....	10,477	202,840	213,317

	1912.	1911.	1910.	1909.	Prior to 1909.	Totals.
Jordan	....	....	20,314	12,754	912,576	945,644
Kellogg	127,412	113,038	142,906	165,458	31,331	580,145
Kinney	530,080	455,836	401,920	287,421	507,928	2,183,185
Knox	101,169	....	50,942	7,464	....	159,575
La Belle	14,896	14,743	20,349	27,216	445,452	522,656
Larkin (Tesora)	16,542	2,668	21,700	46,651	48,071	135,632
La Rue	155,552	30,141	128,658	365,543	912,202	1,592,096
Laura	270,411	238,824	189,046	178,110	590,860	1,467,251
Leetonia	368,301	353,063	615,396	553,162	1,709,334	3,599,256
Leonard	2,198,119	1,293,463	795,431	6,857	851,238	5,145,108
Leonard-Burt	....	100,723	48,969	....	....	149,692
Leonard-Glen	15,932	82,709	143,510	....	....	242,151
Lincoln	173,979	208,556	318,912	303,066	1,841,187	2,845,700
McKinley	....	....	....	89,981	19,105	109,086
Mace	136,524	124,721	15,267	....	....	276,512
Madeira	46,494	56,075	83,922	....	....	186,491
Madrid	26,906	....	....	....	....	26,906
Mahoning	1,518,643	1,011,945	1,515,723	1,561,893	10,969,239	16,577,443
Malta	2,817	10,608	72,035	92,356	951,969	1,129,785
Mariska	....	2,367	23,265	77,690	30,363	133,685
Meadow	10,629	....	4,392	....	....	15.021
Miller	301,518	282,636	216,263	277,119	856,365	1,933,901
Minnewas	....	295	963	....	16,523	17,781
Minorca	37,235	67,942	66,511	119,154	781,309	1,072.151
Mississippi	274,729	328,601	36,581	....	....	639,911
Mohawk	161,539	121,822	123,180	216,291	341,024	963.856

	1912.	1911.	1910.	1909.	Prior to 1909.	Totals.
Monica	92,754	112,952	69,503	7,614	....	282,823
Monroe	....	....	....	147,521	481,378	628,899
Morris	395	40,481	1,364,673	1,831,187	5,485,222	8,721,958
Morton	5,948	....	....	....	....	5,948
Myers	101,558	93,203	131,440	193,698	721,038	1,240,937
Nassau	....	....	39	11,940	19,172	31,151
Onandaga	....	63,798	61,935	59,389	31,408	216,530
Pearce	....	35,343	60,411	....	242,830	338,584
Pearson	75,969	75,696	78,133	68,683	....	298,481
Penobscot	....	189	....	....	706,071	706,260
Perkins	60,523	44,933	80,622	59,029	....	245,107
Pettit	157,208	129,776	62,456	83,548	413,282	846,270
Platt	....	12,382	....	....	....	12,382
Roberts	12,384	....	26,915	....	190,154	229,453
Ruddy	36,551	5,660	....	....	....	42,211
Sauntry-Alpena	1,025,301	1,057,819	242,373	....	700,140	3,025,633
Schley	159,126	120,365	13,369	....	....	292,860
Scranton	254,500	....	....	....	1,168	255,668
Section 17	4,203	....	....	....	....	4,203
Sellers	....	87,275	954,042	626,169	2,244,721	3,912,207
Seville	6,023	....	2,677	23,585	....	32,285
Shenango	805,413	732,978	965,148	805,751	1,497,506	4,806,796
Silverton	....	....	13,740	....	....	13,740
Sliver	378,541	167,225	358,432	256,073	49,291	1,209,562
Spring	....	....	31,909	....	35,773	67,682
Spruce	740,801	638,180	613,947	579,903	4,586,296	7,159,127
St. Paul	42,597	....	....	....	137,430	180,027
Stevenson	682,514	500,323	953,079	1,030,742	8,953,449	12,120,107

	1912.	1911.	1910.	1909.	Prior to 1909.	Totals.
Susquehanna	583,910	147,741	176,869	243,049	340,543	1,492,112
Sweeney	....	....	769	....	7,579	8,348
Syracuse	....	....	2,363	5,509	....	7,872
Tener	....	....	....	256,384	597,381	853,765
Troy	....	....	104,057	86,520	403,304	593,881
Union	213,829	....	....	....	399,877	613,706
Uno North	545,033	479,315	341,939	....	....	1,366,287
Uno South	1,305,216	266,390	....	....	....	1,571,606
Utica	223,006	100,123	232,582	201,480	1,102,169	1,859,360
Victoria	....	43,557	27,592	113,305	176,220	360,674
Virginia Group	619,594	648,588	992,389	1,843,450	6,374,647	10,478,668
Virginia (P., M. & Co.)	200,182	97,667	299,046	....	....	596,895
Wacootah	129,073	7,805	35,498	60,966	165,458	398,800
Webb	166,636	20,237	46,384	....	369,783	603,040
Whiteside	275,915	130,198	....	....	....	406,113
Williams (N. Cincinnati)	39,274	11,250	....	....	97,842	148,366
Wills	....	....	26,712	3,440	16,708	46,860
Winifred	91,806	52,385	67,686	84,614	280,488	576,979
Woodbridge	68,089	....	....	....	....	68,089
Yates	....	....	....	5,362	673,676	679,038
Yawkey	....	....	30,439	45,790	99,899	176,128
Mines idle since 1908	....	....	....	....	25,649,754	25,649,754
Totals	32,047,409	22,093,532	29,201,760	28,176,281	167,548,343	279,067,325

Mines of the Gogebic Range

	1912.	1911.	1910.	1909.	Prior to 1909.	Totals.
Anvil	56,854	310	7,235	22,927	744,035	831,361
Ashland	211,927	151,478	231,506	259,612	5,127,272	5,981,795
Asteroid	70,240	20,570	....	....	....	90,810
Atlantic	142,080	....	79,847	124,845	1,422,278	1,769,050
Brotherton	148,930	65,015	102,626	103,090	1,649,408	2,069,069
Cary	308,292	120,017	205,674	224,251	2,315,896	3,174,130
Castile	136,703	23,598	20,197	26,982	8,265	215,745
Colby	245,195	41,630	194,754	170,095	2,280,252	2,931,926
Eureka	65,716	98,609	41,611	115,662	346,472	668,070
Harmony (Germania)	27,950	....	20,080	152	422,087	470,269
Iron Belt	2,808	....	66,627	44,560	1,140,942	1,254,937
Ironton	173,135	63,359	109,925	277,594	571,391	1,195,404
Mikado	....	....	52,715	99,195	897,890	1,049,800
Montreal	247,772	153,122	187,325	191,611	2,612,874	3,392,704
Newport	973,391	560,760	1,182,324	1,008,354	4,836,685	8,561,514
Norrie Group	1,500,732	883,910	1,333,006	977,054	23,075,870	27,770,572
Ottawa (Odanah)	111,396	44,643	83,389	100,223	381,136	720,787
Palms	39,552	....	....	....	1,284,489	1,324,041
Pence	14,924	26,870	8,954	....	40,566	91,314
Pike	....	....	3,324	22,174	76,558	102,056
Plumer	47,578	....	....	....	....	47,578
Puritan	90,683	....	50,019	....	109,572	250,274
Sunday Lake	155,485	56,096	115,486	93,712	1,213,263	1,634,042

Mines of the Gogebic Range—Continued

	1912.	1911.	1910.	1909.	Prior to 1909.	Totals.
Tilden	158,151	138,387	99,937	154,506	4,934,129	5,485,110
Winona	....	....	10,500	....	....	10,500
Yale (West Colby)	76,772	154,944	108,253	71,458	301,715	713,142
Mines idle since 1908	....	....	....	....	939,401	939,401
Totals	5,006,266	2,603,318	4,315,314	4,088,057	56,732,446	72,745,401

Advances and Declines in Ore and Pig Iron, 1903-1913

Year.	Old Range Bessemer.	Advance or Decline in Price.	Advance or Decline in Per Cent.	Bessemer Pig Iron Valley.	Advance or Decline in Price.	Advance or Decline in Per Cent.
1903	$4.50	.....	....	$21.50	.....	....
1904	3.25	—$1.25	—27.8	13.35	—$8.15	—37.9
1905	3.75	+ .50	+15.4	15.50	+ 2.15	+16.1
1906	4.25	+ .50	+13.3	17.25	+ 1.75	+11.3
1907	5.00	+ .75	+17.6	21.50	+ 4.25	+24.6
1908	4.50	— .50	—10.0	16.00	— 5.50	—25.6
1909	4.50	.....	....	14.75	— 1.25	— 7.8
1910	5.00	+ .50	+11.1	19.00	+ 4.25	+28.8
1911	4.50	— .50	—10.0	15.00	— 4.00	—21.1
1912	3.75	— .75	—16.7	14.25	— .75	— 5.0
1913	4.40	+ .65	+17.3	17.25	+ 3.00	+21.1

Mines of the Menominee Range

	1912.	1911.	1910.	1909.	Prior to 1909.	Totals.
Antoine (Clifford)	....	74,138	91,081	103,626	1,353,792	1,622,637
Aragon	244,894	201,187	241,046	246,984	5,589,297	6,523,408
Armenia	150,808	51,863	65,473	....	311,608	579,752
Baker	....	3,290	39,417	45,003	....	87,710
Baltic	100,736	66,502	171,930	174,426	994,237	1,507,831
Berkshire	33,419	22,273	97,999	34,295	3,440	191,426
Bristol (Claire)	435,619	322,647	270,742	396,825	1,788,542	3,214,375
Calumet	35,587	....	....	....	121,354	156,941
Caspian	306,913	165,660	171,334	189,023	338,948	1,171,878
Chapin	327,571	357,598	465,543	587,647	16,596,287	18,334,646
Chatham	134,079	58,056	51,988	68,730	60,709	373,562
Chicagon	149,619	108,947	....	....	....	258,566
Commonwealth (Buckeye)	49,964	....	89,116	50,787	2,460,997	2,650,864
Cortland	17,498	....	....	....	....	17,498
Crystal Falls	665	710	....	986	1,734,265	1,736,626
Cundy	....	....	....	5,512	715,809	721,321
Davidson	126,207	45,434	....	....	....	171,641
Dunn	242,304	232,093	136,144	193,396	1,328,475	2,132,412
Florence	99,682	95,266	239,161	231,191	2,486,828	3,152,128
Fogarty	84,074	67,616	51,071	77,356	40,509	320,626
Genesee (Ethel)	4,248	25,342	66,185	65,585	405,854	567,214
Gibson	....	57,100	45,202	36,246	20,905	159,453
Great Western	3,342	84,339	80,709	112,747	1,759,481	2,040,618
Groveland	14,320	31,907	26,462	24,933	49,159	146,781
Hemlock	126,132	107,752	115,407	112,481	1,477,337	1,939,109

Mines of the Menominee Range—Continued

	1912.	1911.	1910.	1909.	Prior to 1909.	Totals.
Hiawatha	220,106	116,736	128,884	136,739	348,873	951,338
Hollister	....	5,021	49,434	25,842	21,140	101,437
James	75,702	50,439	78,388	90,851	62,120	357,500
Lamont (Monitor)	....	....	3,183	....	555,341	558,524
Lincoln	....	....	....	1,657	239,970	241,627
Loretto	136,045	18,655	116,048	96,613	1,098,407	1,465,768
Mansfield	....	54,646	114,357	118,713	984,285	1,272,001
McDonald	1,384	5,240	6,022	1,144	....	13,790
Michigan	....	....	17,922	....	153,797	171,719
Millie	1,165	17,040	....	10,887	357,380	386,472
Munro	20,100	9,303	20,022	23,241	255,315	327,981
Penn Iron Mining Co.	429,150	377,026	344,760	428,004	8,072,371	9,651,311
Pewabic	279,769	352,608	380,376	465,453	6,471,336	7,949,542
Quinnesec	....	....	744	3,147	623,324	627,215
Ravenna	18,301	....	....	....	....	18,301
Riverton Group	177,496	198,589	84,269	171,200	1,939,677	2,571,231
Saginaw (Perkins)	....	....	....	19,994	482,991	502,985
Tobin	319,318	308,457	235,812	359,668	1,035,069	2,258,324
Tully	....	8,324	2,726	....	....	11,050
Virgil	2,996	....	....	....	....	2,996
Vivian	28,800	5,971	14,827	....	405,412	455,010
Wickwire	40,417	1,919	....	....	....	42,336
Youngs	83,528	89,451	98,399	154,150	221,235	646,763
Zimmerman	189,482	112,029	25,555	10,303	1,832	339,201
Mines idle since 1908	....	....	....	....	3,369,962	3,369,962
Totals	4,711,440	3,911,174	4,237,738	4,875,385	66,337,670	84,073,407

Mines of the Marquette Range

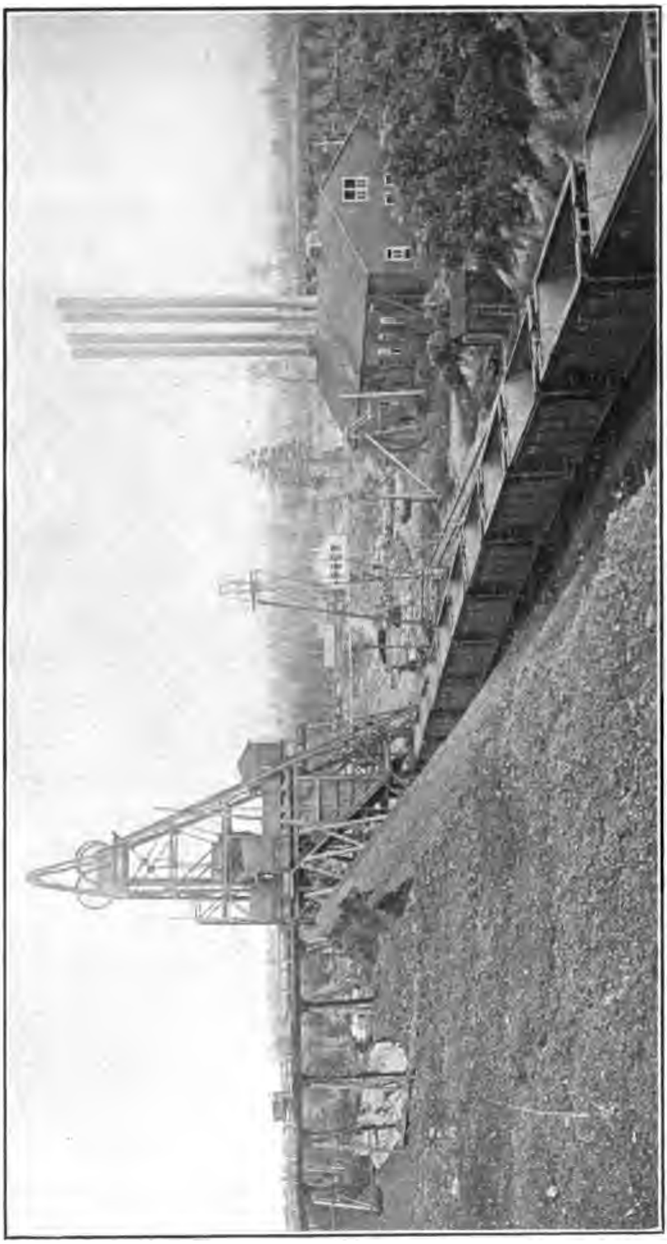
	1912.	1911.	1910.	1909.	Prior to 1909.	Totals.
American (Sterling)	133,306	194,979	163,290	90,001	150,338	731,914
Austin	102,530	105,078	188,588	125,858	307,179	829,233
Beaufort (Ohio)	....	2,684	23,427	72,987	493,718	592,816
Breitung Hematite	122,320	139,582	114,202	129,673	171,910	677,687
Cambria	69,904	90,316	150,422	136,815	1,900,912	2,348,369
Champion	....	....	18,746	11,199	4,383,186	4,413,131
Cleveland-Cliffs Group	1,004,684	344,950	955,374	877,433	20,572,463	23,754,904
Empire	32,933	17,117	53,687	108,993	94,102	306,832
Gwynn	....	197	....	....	....	197
Hartford	....	....	183,471	250,680	1,516,271	1,950,422
Imperial	54,053	84,843	83,404	115,478	261,213	598,991
Jackson	50,166	52,615	40,320	11,060	3,874,153	4,028,314
Lake Angeline	151,910	167,258	244,923	276,749	8,005,162	8,846,002
Lake Superior	219,673	174,959	271,445	349,435	14,612,128	15,627,640
Lillie	109,548	844	10,121	61,708	1,686,782	1,869,003
Lloyd	44,467	28,003	....	....	....	72,470
Lucy (McComber)	73,120	16,677	11,257	1,672	517,359	620,085
Maas	46,249	24,927	208,103	159,197	61,414	499,890
Mary Charlotte	260,801	343,434	197,522	240,433	816,751	1,858,941
Milwaukee-Davis	11,537	7,781	....	....	486,168	505,486
Mitchell	21,141	21,387	23,428	3,549	29,319	98,824
Morris	1,286	....	....	....	....	1,286
Negaunee	446,318	140,406	348,818	312,217	3,349,910	4,597,669
Portland	....	....	49,584	79,652	....	129,236
Princeton (Swanzey)	162,138	27,962	89,441	42,934	1,228,827	1,551,302

Mines of the Marquette Range—Continued

	1912.	1911.	1910.	1909.	Prior to 1909.	Totals.
Queen Group	351,916	297,675	230,119	237,509	5,754,912	6,872,131
Republic	156,864	113,012	150,732	176,575	6,016,896	6,614,079
Richmond	118,554	47,586	95,772	102,566	585,889	950,367
Rolling Mill	115,784	96,585	115,193	133,139	445,777	906,478
Star West (Wheat)	....	4,466	....	....	204,649	209,115
Stegmiller	50,963	45,122	48,842	39,869	....	184,796
Stephenson	214,386	128,839	225,726	64,075	58,893	691,919
Volunteer	9,008	51,240	....	....	1,419,197	1,479,445
Washington	66,749	62,592	96,769	44,716	20,625	291,451
Mines idle since 1908	....	....	....	....	8,621,716	8,621,716
Totals	4,202,308	2,833,116	4,392,726	4,256,172	87,647,819	103,332,141

Mines of the Vermillion Range

	1912.	1911.	1910.	1909.	Prior to 1909.	Totals.
Chandler	73,370	50,206	....	....	9,537,378	9,660,954
Pioneer	647,237	400,919	526,435	477,226	6,514,071	8,565,888
Savoy	90,528	87,964	59,875	83,167	1,276,444	1,597,978
Section 30	157,344	34,298	51,650	....	....	243,292
Sibley	309,076	1,899	206,386	151,009	1,201,566	1,869,936
Soudan	88,714	65,349	75,511	74,862	8,206,990	8,511,426
White Iron	30	....	....	....	....	30
Zenith	478,682	448,295	283,320	321,951	1,280,721	2,812,969
Totals	1,844,981	1,088,930	1,203,177	1,108,215	28,017,170	33,262,473



Kennedy Mine, First Shipper from Cuyuna Range

Mines of the Cuyuna Range

	1912.	1911.	1910.	1909.	Prior to 1909.	Totals.
Armour No. 1	49,539	....	....	....	....	49,539
Armour No. 2	49,031	....	....	....	....	49,031
Kennedy	196,653	147,431	....	....	....	344,084
Thompson	9,888	....	....	....	....	9,888
Totals	305,111	147,431	....	....	....	452,542

Mines of the Wisconsin Fields

	1912.	1911.	1910.	1909.	Prior to 1909.	Totals.
Iron Ridge	19,284	17,002	14,487	15,955	143,039	209,767
Mayville	84,747	98,627	77,195	66,804	345,088	672,461
Mines idle since 1908	....	....	....	....	309,741	309,741
Totals	104,031	115,629	91,682	82,759	797,868	1,191,969
Grand Total	48,221,546	32,793,130	43,442,397	42,586,869	407,081,316	574,125,258

Explanatory References

Mesabi Range

The Alberta is also known as the Athol.

The Burt report includes the Pool.

The Canisteo report includes the Walker.

The Higgins report includes the Chemung.

Mountain Iron was formerly shown as Mountain Iron (Aetna).

The Sauntry-Alpena report includes the Fay.

Spruce was formerly shown as Spruce (Cloquet).

The Virginia group report includes Missabe Mountain and Norman.

Winifred was formerly shown as Winifred (Day).

Gogebic Range

Harmony (Germania) is the same as King.

The Norrie Group includes East Norrie, North Norrie, Pabst, Vaughn, Aurora and Norrie.

Puritan was formerly shown as Puritan (Ruby).

Menominee Range

The Antoine (Clifford) was formerly known as the Traders.

Chapin was formerly shown as Chapin (Ludington).

The Chatham report includes the Brule.

The James (known also as Osana) report includes the Wauseca.

The Millie is also called the Dessau.

The Pewabic includes the Walpole.

The Riverton group was formerly shown as Dober' (Riverton).

Marquette Range

The Milwaukee-Davis mine comprises the old Milwaukee and Grand Rapids (Davis) mines.

The Cleveland-Cliffs Group includes Cliffs Shaft, Salisbury, Lake and Moro.

The Queen Group was formerly shown as Queen (Blue).

The Washington is also called the Barron.

The Winthrop was formerly shown as Winthrop (Marquette).

Vermillion Range

Soudan was formerly shown as Soudan (Minnesota).

Leading Shippers for 13 Years

Year.	Mine.	Shipments.
1912	Hull-Rust	2,232,112
1911	Hill	1,550,568
1910	Hull-Rust	3,189,975
1909	Hull-Rust	3,039,911
1908	Hull-Rust	3,316,782
1907	Hull-Rust	3,271,214
1906	Mountain Iron	2,536,111
1905	Mountain Iron	2,495,089
1904	Stevenson	1,652,021
1903	Fayal	1,460,601
1902	Fayal	1,919,172
1901	Fayal	1,656,973
1900	Fayal	1,252,504

Exploring Outfit on Vermillion Range

Statistics Concerning Upper Lake Ore Docks

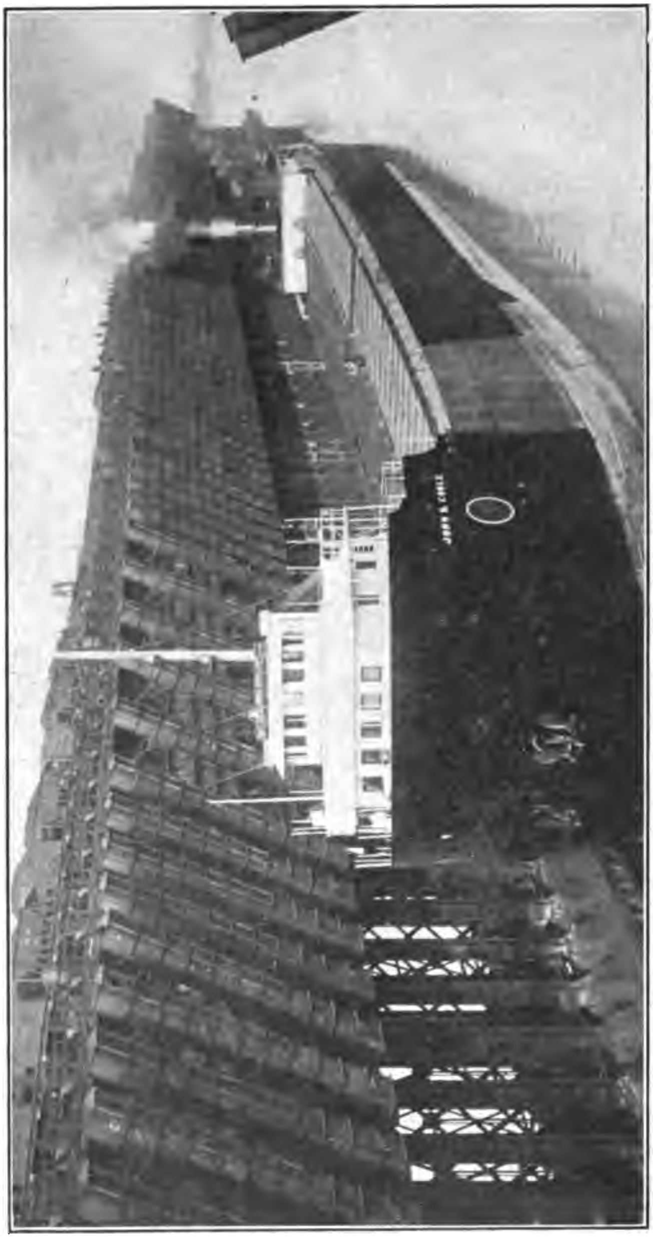
W. A. Clark, chief engineer of the Duluth & Iron Range Rail Road has prepared a table giving particulars of the ore-loading docks on the great lakes. Five of these docks are constructed of steel and concrete, Nos. 1 and 6, at Two Harbors, No. 2 at Presque Isle, No. 4 at Superior, and the Northern Pacific at Superior, ready July 15.

Record of Old and New Range Ore Loading Docks

Railway—Location.	Dock No.	Number of pockets.	Capacity per pocket cars, tons.	Storage capacity gross tons.	Height water to center hinge hole, ft. in.	Height water to deck of dock, ft. in.	Width of dock outside to outside of partition posts, ft. in.	Length of spouts, ft. in.	Length of dock, ft. in.	Angle of pockets, deg. min.	Cubic feet per pocket to bottom of stringers.
Chicago & Northwestern Ry., Escanaba, Mich..	3	226	2 @ 50 1 @ 25	28,250	31 2	52 8	37 0	27 0	1,356	45 00	1,969
Chicago & Northwestern Ry., Escanaba, Mich..	4	250	2 @ 50 1 @ 25	31,250	36 6	59 2	37 0	30 0	1,500	45 00	2,191
Chicago & Northwestern Ry., Escanaba, Mich..	5	370	5 @ 50	92,500	37 9⅝	70 9	52 2	32 1½	2,200	45 00	4,142
Chicago & Northwestern Ry., Escanaba, Mich..	6	320	5 @ 50	80,000	40 0	70 0	50 2	30 0	1,920	45 00	4,114
Chicago & Northwestern Ry., Ashland, Wis....	1	234	5 @ 50	58,500	40 0	72 11	50 2	30 0	1,404	45 00	4,100
Chicago & Northwestern Ry., Ashland, Wis....	2	234	4 @ 50	46,800	40 0	70 0	50 2	30 0	1,404	45 00	3,915
Total		1,634		337,300							
Duluth & Iron Range Ry., Two Harbors, Minn.	1	224	5 @ 50	56,000	39 3	74 0	51 8	34 0	1,376	48 00	4,075
Duluth & Iron Range Ry., Two Harbors, Minn.	2	208	3 @ 50	31,200	33 5	57 6	49 0	27 0	1,280	38 42	3,006
Duluth & Iron Range Ry., Two Harbors, Minn.	3	170	3 @ 50	25,500	40 0	66 0	49 0	27 0	1,054	43 32	3,006
Duluth & Iron Range Ry., Two Harbors, Minn.	4	168	3 @ 50	25,200	37 0	62 0	49 0	29 0	1,042	38 42	3,270
Duluth & Iron Range Ry., Two Harbors, Minn.	5	168	3 @ 50	25,200	39 0	66 9	49 0	30 0	1,050	43 32	3,126
Duluth & Iron Range Ry., Two Harbors, Minn.	6	148	5 @ 50	37,000	40 0	73 0	51 3¼	32 4	920	45 00	4,272
Total		1,086		200,100							

Statistics Concerning Upper Lake Ore Docks—Continued

Duluth, Missabe & Northern Ry., Duluth, Minn.	2	384	2 @ 50	38,400	32 0	57 6	49 0	27 9	2,336	45 00	2,368
Duluth, Missabe & Northern Ry., Duluth, Minn.	3	384	3 @ 50	57,600	40 7	67 ½	59 0	27 9	2,304	45 00	2,782
Duluth, Missabe & Northern Ry., Duluth, Minn.	4	384	4 @ 50	76,800	41 9½	72 6	57 0	30 1½	2,304	45 00	3,867
Total		1,152		172,800							
Great Northern Ry., Superior, Wis............	1	374	6 @ 50	112,200	40 0	73 0	62 8	32 4	2,244	45 00	4,972
Great Northern Ry., Superior, Wis............	2	350	6 @ 50	105,000	40 0	73 0	62 8	32 4	2,100	45 00	4,972
Great Northern Ry., Superior, Wis............	3	326	6 @ 50	97,800	40 0	73 0	62 8	32 4	1,956	45 00	4,972
Great Northern Ry., Superior, Wis............	4	302	6 @ 50	90,600	40 2	75 0	62 6	34 6	1,812	47 30	5,347
Total		1,352		405,600							
Northern Pacific Ry., Superior, Wis...........	1	102	7 @ 50	35,700	40 6	80 0	57 2	34 0	684	47 30	5,600
Duluth, South Shore & Atlantic Ry., Marquette	4	200	2 @ 50	20,000	27 9	47 3	36 8	21 1	1,200	39 45	1,839
Duluth, South Shore & Atlantic Ry., Marquette	5	200	4 @ 50 1 @ 25	45,000	40 0	70 10	51 0	32 4	1,236	45 00	3,848
Total		400		65,000							
Lake Superior & Ishpeming Ry., Marquette...	1	200	2 @ 50 1 @ 25	25,000	30 9	54 0	50 0	27 7	1,200	38 40	2,713
	2	200	5 @ 50	50,000	43 0	75 0	54 0	35 0	1,200	45 00	4,590
Total		400		75,000							
Minn., St. P. & S. Ste. Marie Ry., Ashland...	1	314	2 @ 50	31,400	40 0	66 2	36 0	27 0	1,908	50 45	2,435
Minn., St. P. & S. Ste. Marie Ry., Superior...	1	300	6 @ 50	90,000	42 5⅜	78 0	58 0	32 1½	1,800	47 00	4,775
Total		614		121,400							
Chicago, Milwaukee & St. Paul Ry., Escanaba.	1	240	3 @ 50 1 @ 25	42,000	40 2¾	66 6	52 0	120 @ 27 120 @ 29	1,500	45 00	2,900
Chicago, Milwaukee & St. Paul Ry., Escanaba.	2	240	4 @ 50	48,000	40 11½	69 2	54 0	30 4½	1,500	45 00	3,150
Total		480		90,000							
Algoma Cent. & Hud. Bay Ry., Michipicoten, Ont..	1	12			34 0	43 4	25 0	22 6	311 9	44 00	
Canadian North. & Ont. Ry., Key Harbor, Ont.	1	20	2 @ 50	2,000	41 5	61 9	28 0	30 0	240	37 30	2,315



Loading Bulk Freighter at New D. & I. R. Docks, Two Harbors

Mines Shipping Over 5,000,000 Tons

Rank.	Mine.	Range.	Total Shipments.
(1)	**Norrie Group**	**Gogebic**	27,770,572
(2)	**Cleveland-Cliffs Group**	**Marquette**	23,754,904
(3)	**Hull-Rust**	**Mesabi**	20,958,235
(4)	Fayal	Mesabi	20,520,032
(5)	**Chapin**	**Menominee**	18,334,646
(6)	*Mountain Iron*	*Mesabi*	17,198,871
(7)	Mahoning	Mesabi	16,577,443
(8)	Lake Superior	Marquette	15,627,640
(9)	Adams	Mesabi	15,248,914
(10)	Stevenson	Mesabi	12,120,107
(11)	*Burt*	*Mesabi*	11,284,023
(12)	Virginia Group	Mesabi	10,478,668
(13)	Biwabik	Mesabi	10,189,371
(14)	**Chandler**	**Vermillion**	9,660,954
(15)	Penn Iron Mining Co.	Menominee	9,651,311
(16)	Lake Angeline	Marquette	8,846,002
(17)	Morris	Mesabi	8,721,958
(18)	Pioneer	Vermillion	8,565,888
(19)	Newport	Gogebic	8,554,480
(20)	Soudan	Vermillion	8,511,426
(21)	Pewabic	Menominee	7,949,542
(22)	Spruce	Mesabi	7,159,127
(23)	Queen Group	Marquette	6,872,131
(24)	Republic	Marquette	6,614,079
(25)	Aragon	Menominee	6,523,408
(26)	Ashland	Gogebic	5,981,795
(27)	Genoa	Mesabi	5,507,903
(28)	Tilden	Gogebic	5,485,110
(29)	Leonard	Mesabi	5,145,108

Of the 29 leading mines shown, the Mesabi has 13; Marquette, five; Menominee, four; Gogebic, four; Vermillion, three.

The mines shown in italics did not ship ore in 1912.

The mines shown in black face are the leading shippers from the respective ranges.

Shipments by Ranges—Gross Tons

	1912.	1911.	1910.	1909.	1908.	1907.	1906.
Marquette range	4,202,308	2,833,116	4,392,726	4,256,172	2,414,632	4,388,073	4,057,187
Menominee range	4,711,440	3,911,174	4,237,738	4,875,385	2,679,156	4,964,728	5,109,088
Gogebic range	5,006,266	2,603,318	4,315,314	4,088,057	2,699,856	3,637,102	3,643,514
Vermillion range	1,844,981	1,088,930	1,203,177	1,108,215	841,544	1,685,267	1,792,355
Mesabi range	32,047,409	22,093,532	29,201,760	28,176,281	17,257,350	27,495,708	23,819,029
Cuyuna range	305,111	147,431	....	....	....	....	....
Miscellaneous	104,031	115,629	91,682	82,759	122,449	95,790	144,589
Total	48,221,546	32,793,130	43,442,397	42,586,869	26,014,987	42,266,668	38,565,762

Percentage of Shipments

	1890.	1895.	1900.	1905.	1908.	1909.	1910.	1911.	1912.
Marquette range	33.25	20.08	18.12	12.26	09.28	09.99	10.12	08.64	08.71
Menominee range	25.35	18.42	17.09	13.07	10.30	11.45	09.75	11.93	09.77
Gogebic range	31.63	24.39	15.07	10.78	10.38	09.60	09.93	07.94	10.38
Vermillion range	09.77	10.32	08.68	04.88	03.23	02.61	02.77	03.32	03.83
Mesabi range	.....	26.63	40.93	58.63	66.34	66.16	67.22	67.37	66.46
Cuyuna range	.....	.....	.....	.....	.....	.....	.....	00.45	00.63
Miscellaneous	.....	00.16	00.11	00.38	00.47	00.19	00.21	00.35	00.22
Totals	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Comparative Shipments by Ranges—Gross Tons

	1912.	1911.	Increase.
Mesabi	32,047,409	22,093,532	9,953,877
Gogebic	5,006,266	2,603,318	2,402,948
Menominee	4,711,440	3,911,174	800,266
Marquette	4,202,308	2,833,116	1,369,192
Vermillion	1,844,981	1,088,930	756,051
Cuyuna	305,111	147,431	157,680
Miscellaneous in Wisconsin	104,031	115,629	† 11,598
Totals	48,221,546	32,793,130	15,428,416
By lake	47,435,777	32,130,411	15,305,366
By rail	785,769	662,719	123,050

†Decrease.

Shipments by Ports and All-Rail—Gross Tons

	1912.	1911.	1910.	1909.	1908.	1907.	1906.
Escanaba	5,234,655	4,278,445	4,959,726	5,747,801	3,351,502	5,761,988	5,851,050
Marquette	3,296,761	2,200,380	3,248,516	2,909,451	1,487,487	3,013,826	2,791,033
Ashland	4,797,101	2,429,290	4,094,374	3,834,207	2,513,670	3,436,867	3,388,106
Two Harbors	9,370,969	6,367,537	8,271,177	9,181,132	5,702,237	8,188,906	8,180,125
Superior	14,240,714	9,920,490	8,414,799	6,540,505	3,564,030	7,440,386	6,083,057
Duluth	10,495,577	6,934,269	13,640,166	13,470,503	8,808,168	13,448,736	11,220,218
Total by lake	47,435,777	32,130,411	42,628,758	41,683,599	25,427,094	41,290,709	37,513,589
Total by rail	785,769	662,719	813,639	903,270	587,893	975,959	1,052;173
Total	48,221,546	32,793,130	43,442,397	42,586,869	26,014,987	42,266,668	38,565,762

Record of Each Range by Years

Marquette Range

1912	4,202,308
1911	2,833,116
1910	4,392,726
1909	4,256,172
1908	2,414,632
1907	4,388,073
1906	4,057,187
1905	4,215,572
1904	2,843,703
1903	3,040,245
1902	3,868,025
1901	3,245,346
1900	3,457,522
1899	3,757,010
1898	3,125,039
1897	2,715,035
1896	2,604,221
1895	2,097,838
1894	2,060,260
1893	1,791,520
1892	2,666,856
1891	2,512,242
1890	2,993,664
1889	2,634,816
1888	1,918,750
1887	1,851,414
1886	1,627,380
1885	1,480,422
1884	1,548,034
1883	1,305,425
1882	1,829,394
1881	1,579,834
1880	1,384,010
1879	1,130,019
1878	1,033,082
1877	1,010,494
1876	992,764
1875	891,257
1874	919,557
1873	1,162,458
1872	900,901
1871	779,607
1870	830,940
1869	617,444
1868	491,449
1867	473,567
1866	278,796
1865	236,208
1864	243,127
1863	203,055
1862	124,169
1861	49,909
1860	114,401
1859	68,832
1858	15,876
1857	25,646
1856	36,343
1855	1,449
1844 to 1854	3,000
Total	103,332,141

Menominee Range

1912	4,711,440
1911	3,911,174
1910	4,237,738
1909	4,875,385
1908	2,679,156
1907	4,964,728
1906	5,109,088
1905	4,495,451
1904	3,074,848
1903	3,749,567
1902	4,612,509
1901	3,619,053
1900	3,261,221
1899	3,301,052
1898	2,522,265
1897	1,937,013
1896	1,560,467
1895	1,923,798
1894	1,137,949
1893	1,610,244
1892	2,261,499
1891	1,824,619
1890	2,282,237
1889	1,796,755
1888	1,191,101
1887	1,193,343
1886	880,006
1885	690,435
1884	895,634
1883	1,047,415
1882	1,136,018
1881	727,171
1880	524,735
1879	245,672
1878	78,028
1877	4,593
Total	84,073.407

Cuyuna Range

1912	305,111
1911	147,431
Total	452,542

Gogebic Range

1912	5,006,266
1911	2,603,318
1910	4,315,314
1909	4,088,057
1908	2,699,856
1907	3,637,102
1906	3,643,514
1905	3,705,207
1904	2,398,287
1903	2,912,708
1902	3,654,929
1901	2,938,155
1900	2,875,295
1899	2,795,856
1898	2,498,461
1897	2,258,236
1896	1,799,971
1895	2,547,976
1894	1,809,468
1893	1,285,246
1892	2,971,991
1891	1,839,574
1890	2,847.786
1889	2,016,391
1888	1,424,699
1887	1,303,267
1886	747,589
1885	119.860
1884	1,022
Total	72,745,401

Vermillion Range

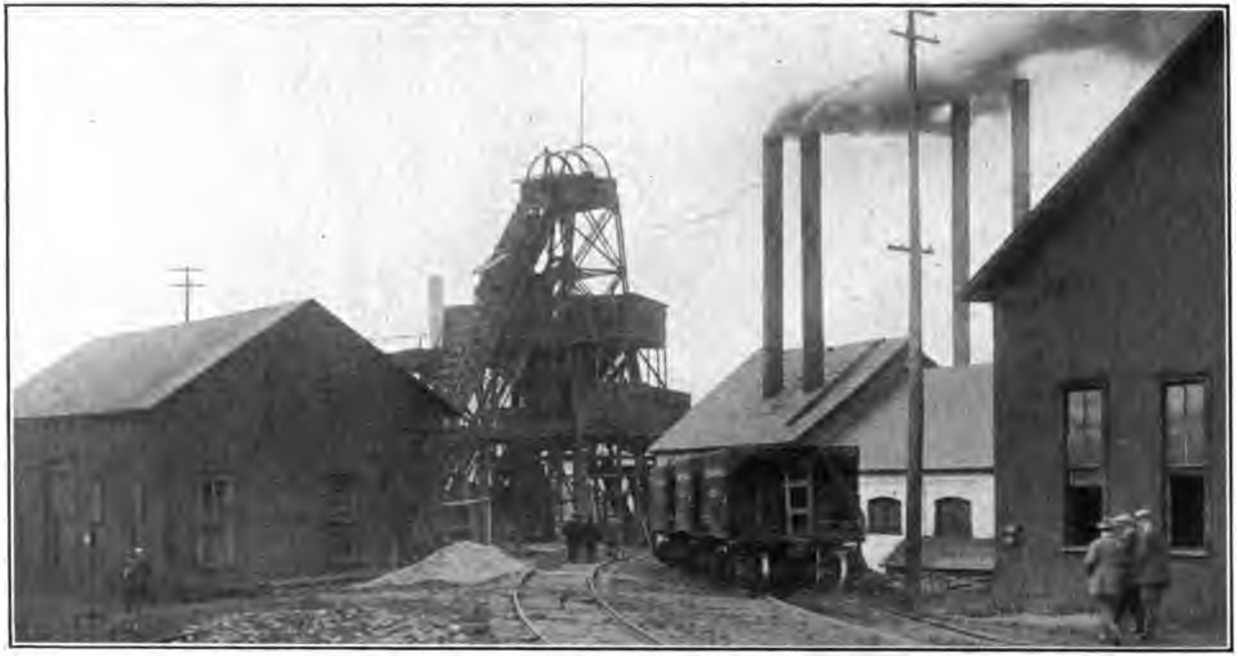
1912	1,844,981
1911	1,088,930
1910	1,203,177
1909	1,108,215
1908	841,544
1907	1,685,267
1906	1,792,355
1905	1,677,186
1904	1,282,513
1903	1,676,699
1902	2,084,263
1901	1,786,063
1900	1,655,820
1899	1,771,502
1898	1,265,142
1897	1,278,481
1896	1,088,090
1895	1,077,838
1894	948,513
1893	820,721
1892	1,167,650
1891	894,618
1890	880,014
1889	844,682
1888	511,953
1887	394,252
1886	304,396
1885	225,484
1884	62,124
Total	33,262,473

Mesabi Range

1912	32,047,409
1911	22,093,532
1910	29,201,760
1909	28,176,281
1908	17,257,350
1907	27,495,708
1906	23,819,029
1905	20,158,699
1904	12,156,008
1903	12,913,742
1902	13,342,840
1901	9,004,890
1900	7,809,535
1899	6,626,384
1898	4,613,766
1897	4,275,809
1896	2,882,079
1895	2,781,587
1894	1,793,052
1893	613,620
1892	4,245
Total	279,067,325

Miscellaneous in Wisconsin

1912	104,031
1911	115,629
1910	91,682
1909	82,759
1908	122,449
1907	95,790
1906	144,589
1905	132,001
1904	94,042
1903	36,749
1902	23,338
1901	22,400
1900	20,986
1899	19,731
1898	18,151
1897	10,546
1896	13,144
1895	16,472
1894	10,511
1893	7,925
1892	9,044
Total	1,191,969



Shaft of Ashland Mine, Gogebic Range

Ore on Lake Erie Docks, May 1,—Gross Tons

	1912.	1911.	1910.	1909.	1908.	1907.	1906.*
Toledo	356,102	383,761	366,631	380,675	217,788	147,397	52,550
Sandusky	2,471	11,458	22,468	31,528	42,256	5,439	29,320
Huron	257,496	273,042	336,693	379,364	392,731	98,106	80,738
Lorain	287,294	346,849	205,445	362,096	327,052	176,300	140,452
Cleveland	1,363,696	1,476,278	985,725	1,018,055	1,029,198	447,573	350,382
Fairport	381,705	633,485	541,299	562,679	225,328	154,246	266,162
Ashtabula	2,108,749	2,255,066	1,444,102	1,392,430	1,799,454	568,485	462,564
Conneaut	229,462	419,421	461,365	497,203	462,392	139,853	148,528
Erie	585,150	653,778	550,187	557,029	595,660	189,276	169,488
Buffalo	309,120	325,356	364,336	189,209	388,441	50,313	90,906
Total	5,881,245	6,778,494	5,278,251	5,370,268	5,480,300	1,976,988	1,791,090

*Includes April, 1906, receipts.

Ore on Lake Erie Docks, December 1,—Gross Tons

	1912.	1911.	1910.	1909.	1908.	1907.	1906.
Toledo	552,016	661,382	433,215	332,456	590,925	518,645	281,000
Sandusky	2,472	2,471	17,728	39,557	36,079	44,546	17,467
Huron	385,810	344,371	375,118	477,333	458,158	415,730	245,499
Lorain	320,713	314,321	259,448	407,129	426,274	366,271	336,321
Cleveland	1,888,560	1,589,491	1,638,795	1,547,142	1,458,392	1,281,335	1,224,606
Fairport	565,920	636,566	839,970	867,640	835,821	523,981	590,783
Ashtabula	3,350,553	3,295,862	3,287,816	2,594,359	2,293,531	2,056,820	1,631,312
Conneaut	1,429,533	1,237,573	1,329,997	1,411,002	1,296,675	1,000,774	1,057,424
Erie	661,330	636,274	792,011	788,046	730,530	652,219	552,631
Buffalo	340,261	413,353	452,783	501,125	315,148	435,407	315,412
Total	9,497,168	9,131,664	9,426,881	8,965,789	8,441,533	7,385,728	6,252,455

Ore Receipts at Lake Erie Ports—Gross Tons

	1912.	1911.	1910.	1909.	1908.	1907.	1906.
Toledo	1,405,023	493,345	1,225,202	1,374,224	680,553	1,314,140	1,423,741
Sandusky	....	....	....	11,088	....	83,043	35,847
Huron	540,586	223,947	197,951	243,082	213,377	971,430	778,453
Lorain	3,771,350	2,937,605	2,884,738	2,796,856	2,286,388	2,621,025	2,191,965
Cleveland	7,914,836	4,584,211	6,344,943	6,051,342	4,240,816	6,495,998	6,604,661
Fairport	1,810,381	666,365	1,516,434	1,734,277	1,518,961	2,437,649	1,861,498
Ashtabula	8,158,080	6,359,131	9,620,638	8,056,941	3,012,064	7,521,859	6,833,352
Conneaut	7,839,831	6,931,278	6,309,548	7,007,834	4,798,631	5,875,937	5,432,370
Erie	547,067	289,400	942,592	1,235,057	828,602	2,294,239	1,986,539
Buffalo	5,060,642	2,802,976	4,704,439	5,002,235	2,835,099	5,580,438	4,928,331
Detroit	418,057	243,292	296,412	159,889	112,561	153,157	117,448
Total	37,465,853	25,531,550	34,042,897	33,672,825	20,527,052	35,348,915	32,194,205

Ore Receipts at Lake Michigan Ports—Gross Tons

	1912.	1911.	1910.	1909.
Elk Rapids, Mich.	47,947	26,814	60,857	46,037
East Jordan, Mich.	42,878	36,232	37,910	18,623
Milwaukee, Wis.	138,065	109,255	121,446	178,720
Gary, Ind.	2,088,327	1,302,745	1,775,880	1,921,818
Indiana Harbor, Ind.	514,748	365,312	287,172	....
South Chicago, Ill.	5,480,105	3,685,100	5,080,679	4,673,810
Boyne City, Mich.	45,000	33,000	50,355	37,062
Fruitport, Mich.	....	....	37,785	53,761
Total	8,357,070	5,558,458	7,452,084	6,929,831

Distribution of Lake Ore Movement—Tonnages

	1912.	1911.	1910.	1909.
Lake Erie ports	37,465,853	25,531,550	34,042,897	33,672,825
Lake Michigan ports	8,357,070	5,558,458	7,452,084	6,929,831
Other points	1,138,496	719,099	707,489	664,107
Total by lake ....(Bill of lading weight)	46,961,419	31,809,107	42,202,470	41,266,763
	474,358	321,304	426,288	416,836
Total by lake.........(Mine weight)	47,435,777	32,130,411	42,628,758	41,683,599

Distribution of Lake Ore Movement—Percentages

	1912.	1911.	1910.	1909.
Lake Erie ports	79.78	80.27	80.66	81.60
Lake Michigan ports	17.80	17.47	17.66	16.79
Other points	02.42	02.26	01.68	01.61
Total	100.00	100.00	100.00	100.00

Other points include Sault Ste. Marie, Point Edward, Midland and Deseronto in Ontario, Canada, and Sydney, Nova Scotia, Canada. Detroit receipts are included in the total for Lake Erie.

Shipments from Lake Erie Docks

*Ore on Lake Erie Docks May 1.**

	Gross Tons.
1912	5,881,245
1911	6,778,494
1910	5,278,251
1909	5,370,268
1908	5,480,300
1907	1,976,988
1906	1,766,329
1905	2,271,631
1904	4,534,103
1903	3,592,367
1902	2,848,194
1901	3,050,183
1900	1,720,656

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*The above figures do not include ore received in the April preceding.

Ore Receipts at Lake Erie Ports During Navigation Season

	Gross Tons.
1912	37,465,853
1911	25,531,550
1910	34,042,897
1909	33,672,825
1908	20,527,052
1907	35,348,915
1906	32,194,205
1905	28,941,259
1904	17,932,814
1903	19,681,731
1902	22,649,424
1901	17,014,076
1900	15,797,787

*Ore on Lake Erie Docks Dec. 1.**

	Gross Tons.
1912	9,497,168
1911	9,131,664
1910	9,426,881
1909	8,965,789
1908	8,441,533
1907	7,385,728
1906	6,252,455
1905	6,438,967
1904	5,763,399
1903	6,371,085
1902	7,074,254
1901	5,859,663
1900	5,904,670

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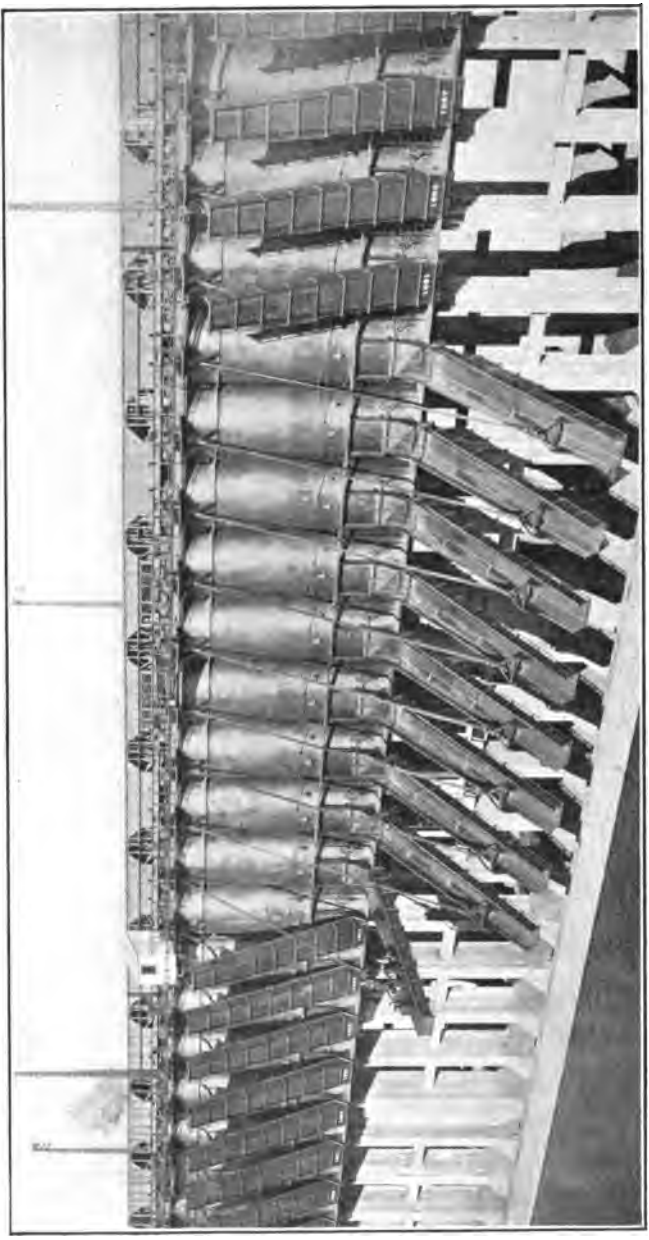
*Ore received in December is credited as on dock, Dec. 1.

Ore Shipments to Furnaces from Lake Erie Docks from Opening of Navigation Season to Dec. 1.

	Gross Tons.
1912	33,849,930
1911	23,178,380
1910	29,894,267
1909	30,077,304
1908	17,565,819
1907	29,940,175
1906	27,708,079
1905	24,773,923
1904	16,703,518
1903	16,903,013
1902	18,423,364
1901	14,204,596
1900	11,613,773



Face of a Concrete Dock Showing Steel Pocket Fronts

*Ore Shipments to Furnaces from Lake Erie Docks**

	Gross Tons.
Dec. 1, 1911, to May 1, 1912	3,250,419
Dec. 1, 1910, to May 1, 1911	2,648,387
Dec. 1, 1909, to May 1, 1910	3,687,538
Dec. 1, 1908, to May 1, 1909	3,071,265
Dec. 1, 1907, to May 1, 1908	1,905,428
Dec. 1, 1906, to May 1, 1907	4,275,467
Dec. 1, 1905, to May 1, 1906	4,672,638
Dec. 1, 1904, to May 1, 1905	3,491,768
Dec. 1, 1903, to May 1, 1904	1,836,982
Dec. 1, 1902, to May 1, 1903	3,481,887
Dec. 1, 1901, to May 1, 1902	3,011,469
Dec. 1, 1900, to May 1, 1901	2,854,487
Dec. 1, 1899, to May 1, 1900	3,809,627

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*Ore received in December is credited as on dock, Dec. 1. Ore received in April is not credited as on dock, May 1.

*Total Shipments to Furnaces from Lake Erie Docks for Years ending May 1**

	Gross Tons.
1912	26,428,799
1911	32,542,654
1910	33,764,842
1909	20,637,084
1908	31,845,603
1907	31,983,546
1906	29,446,561
1905	20,195,286
1904	18,739,995
1903	21,905,251
1902	17,216,065
1901	14,468,260
1900	15,882,881
1899	12,122,982
1898	10,209,488
1897	6,719,633

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*Ore received and shipped in April is not credited above in total shipments for the year ending the May 1 following, but is included in the next year's total. Therefore, for example, the 26,428,799 tons shown above for 1912 represent the approximate movement to furnaces until May 1, 1912, of ore received in 1911.

Shipments of Mines Idle Since 1908

Marquette Range

	Gross tons.		Gross tons.
Ames	6,298	N. Y. Hematite	37,587
Bay State	16,637	New York (York)	1,123,071
Bessie	59,097	N. Republic	289
Boston	62,542	Northwest	1,687
Braastad (Mitchell)	136,736	Nonpareil (St. Law)	23,395
Braastad (Winthrop)	831,445	Norwood	5,753
Chicago	9,012	Ogden	986
Columbia (Klomin)	94,813	Palmer	14,172
Curry	16,671	Pascoe	59,806
Detroit	140,841	Pendill	45,993
Dexter	118,512	Phenix (Dalliba)	59,114
Dey	2,709	Pioneer	15,409
East Champion	76,002	Platt	73,844
East N. Y	327,604	Primrose	6,040
Edison	893	Quartz	491
Erie	8,136	Republic Reduc. Co	47,174
Etna	1,091	Richards	8,261
Fitch	31,817	Riverside	16,160
Foxdale	31,447	Saginaw	451,424
Goodrich	49,754	Samson (Argyle)	267,805
Hortense (N. Cham.)	30,574	Schadt	1,261
Humboldt	723,961	Section 12	21,887
Iron Mount	393	Spurr	164,244
Magnetic (stock pile)	292	Taylor	32,970
Manganese	6,359	Titan	90,371
Michigamme	880,362	Webster	34,905
Mesabi's Friend	16,043	W. Republic	133,077
Moore	68,131	Wetmore	50,870
National	150,216	Wheeling	10,552
Negaunee Con. Works	12,708	Winthrop	1,912,022
Total			8,621,716

Gogebic Range

	Gross tons.		Gross tons.
Bessemer	20,889	Iron Chief No. 2	551
Blue Jacket	1,799	Jack Pot	99,090
Chicago	68,727	Meteor (Comet)	216,367
Davis (Wis.)	103,961	Shores	55,808
Federal	36,443	Sparta	4,862
First National	1,997	Trimble	25,931
Geneva	7,108	Tyler's Forks	10,683
Hennepin	259,733	Upson	11,375
Iron Chief	12,199	Valley	1,878
Total			939,401

SHIPMENTS OF IDLE MINES

Menominee Range

	Gross tons.		Gross tons.
Alpha	1,370	Keel Ridge	93,101
Beta	4,211	Kimball	16,224
Breen	75,425	Lee Peck (Cherry Valley Ore)	2,844
Brier Hill	14,981	Manganate	6,844
Columbia	942,703	Mastodon	425,708
Cornell	49,302	Metropolitan	107,027
Cuff	58,419	Monongahela	9,310
Delphic	33,770	Nanaimo	373,765
Eleanor (Appleton)	18,719	Northwestern	35,810
Emmett	66,585	Perry	3,138
Fairbanks (P't. R.)	379,789	Selden	2,092
Forest	11,988	Sheridan	116,299
Half and Half	7,524	South Mastodon	8,203
Hamilton (Ore Co.)	96,072	Stephenson	39,350
Hersel	955	Sturgeon River	19,404
Hilltop	20,229	Verona	130,975
Hope	28,530	Youngstown	151,425
Indiana	17,871		
Total			3,369,962

Mesabi Range

	Gross tons		Gross tons.
Ajax (Kanawha)	207,650	Longyear	121,391
Auburn	2,143,028	Mayas	220,765
Canton	713,048	Morrow	279,296
Cass	241,343	Mountain Iron	17,198,871
Columbia	16,987	Pillsbury	1,640,265
Day	319,453	Sharon	329,535
Diamond	171	Sparta	1,244,197
Frantz	145,069	St. Clair	94,688
Hobart	8,314	Stephens	454,819
Holland	270,864		
Total			25,649,754

Miscellaneous in Wisconsin

	Gross tons.
Illinois	309,741
Total	309,741

Grand total	**38,890,574**

Receipts at Lake Erie Ports and Percentage

Year.	Total Lake Movement.	Lake Erie Receipts.	Percentage.
1912	47,435,777	37,465,853	79.78
1911	32,130,411	25,531,550	80.27
1910	42,628,758	34,042,897	80.66
1909	41,683,599	33,672,825	81.60
1908	25,427,094	20,527,052	81.54
1907	41,290,709	35,348,915	86.47
1906	37,513,589	32,194,205	86.69
1905	33,476,904	28,941,259	87.32
1904	21,226,591	17,932,814	85.34
1903	23,649,550	19,681,731	84.06
1902	27,039,169	22,649,424	84.61
1901	20,157,522	17,014,076	85.26
1900	18,570,315	15,797,787	85.93
Total	412,229,988	340,800,388	83.51

In the above table, the total lake movement is on the basis of mine weights; the Lake Erie receipts are bill-of-lading weights. The total movement was put on the basis of bill-of-lading weights, before the percentages were found.

Iron Ore Imports for Past Three Years

	1912.	1911.	1910.
Cuba	1,398,593	1,147,879	1,451,096
Sweden	333,863	219,238	259,911
Newfoundland and Labrador	145,355	174,853	209,006
Canada	106,675	50,480	95,005
Spain	92,061	194,965	439,868
Other countries	28,029	24,317	136,145
Total	2,104,576	1,811,732	2,591,031

New Mines

Mines making their first shipments in 1912 were:

On the Mesabi: Grace, Inland Steel Co.; Madrid, Euclid Mining Co.; Section 17, Euclid Mining Co.; Morton, of the Tod-Stambaugh Co.; Woodbridge, of Oglebay, Norton & Co.

On the Gogebic: Plumer, Oliver Iron Mining Co.

On the Menominee: Cortland, Wickwire Steel Co.; Virgil, Wickwire Steel Co.; Ravenna, M. A. Hanna & Co.

On the Marquette: Morris, Cleveland-Cliffs Iron Co.

On the Cuyuna: Armour No. 1, Rogers, Brown Ore Co.; Armour No. 2, Rogers, Brown Ore Co.; Thompson, Inland Steel Co.

On the Vermillion: A small shipment for test purposes from the White Iron, White Iron Lake Iron Co.

Canadian Shipments

Shipments from Canadian mines: Helen, Lake Superior Corporation; in 1912, 48,838 tons; in 1911, 128,628 tons; in 1910, 115,790 tons; Moose Mountain, of Oglebay, Norton & Co.; in 1912, 39,061 tons; in 1911, 6,678 tons; in 1910, 72,470 tons.

Number of Shippers

In 1912, 194 mines shipped: in 1911, 184; in 1910, 196; in 1909, 172. These were divided as follows: In 1912, Mesabi 92, Menominee 37, Marquette 28, Gogebic 23, Vermillion 8, Cuyuna 4, Wisconsin fields 2. In 1911, Mesabi 90, Menominee 38, Marquette 29, Gogebic 17, Vermillion 7, Cuyuna 1, Wisconsin fields 2.

Average Mine Shipments

Average mine shipments per range for the past two years were as follows:

	Gross Tons.	
	1912.	1911.
Mesabi	348,341	245,484
Vermillion	263,564	155,561
Gogebic	217,664	153,136
Marquette	150,082	97,694
Menominee	127,336	102,926
Lake Superior District	249,853	178,223

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